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# A Causal-Comparative Model For The Examination Of An Online Teacher Professional Development Program For An Elementary Agricultural Literacy Curriculum

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# A CAUSAL-COMPARATIVE MODEL FOR THE EXAMINATION OF AN ONLINE TEACHER PROFESSIONAL DEVELOPMENT PROGRAM FOR AN ELEMENTARY AGRICULTURAL LITERACY CURRICULUM

by

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# ABSTRACT

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by

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The purpose of this study was to determine the effectiveness of a teacher professional development program as measured by the extent that participants have continued to use lessons and materials up to three years after the professional development experience. The professional development program was delivered online and structured by five key characteristics of effective professional development.

Sixty-five participants of *Food, Land, and People* (*FLP*) professional development completed an online survey answering certain demographic variables and indicating the number of lessons and activities they had used from the *FLP* professional development. An implementation and continued use measurement model was used to create weighted *FLP* use scores and compare participants within each group. Results suggest that the *FLP* professional development program was effective in obtaining long-term continued use of materials.

(171 pages)

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Clay L Rasmussen

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# CHAPTER I

# INTRODUCTION

Professional development has been used to motivate and provide continued instruction for teachers for many years (Saylor & Kehrhahn, 2003). When introducing new curricula, implementing new teaching strategies, or incorporating new ideas, some type of professional development has traditionally been used. Over time, a wide variety of professional development models and methods have been implemented.

While many professional development models currently exist, most have traditionally been delivered in a face-to-face manner where participants are able to see and hear a presenter at the same time the presenter is able to see and hear the participants (Cole & Styron, 2006). In the past, this was the only way to deliver professional development. Currently, advances in technology have made it possible for professional development to be delivered online. There are two types of online delivery methods, synchronous and asynchronous. Synchronous delivery requires participants to log on at specific times while asynchronous delivery allows the participants to log on and work according to their own schedule (Brown & Green, 2003). Traditionally, participants of online courses were not able to see or personally interact with the providers of the professional development. Participants were often expected to work at their own pace and learn from the professional development without personal interaction from the provider. The provider of the professional development provided feedback to participants through email, online discussions, and information postings.

Regardless of the delivery method, literature on teacher professional development

has identified several characteristics that are considered key to providing effective professional development programs. Effective teacher professional development has the following characteristics: (a) a focus on teaching specific content (Loucks-Horsley, Love, Stiles, Mundry, & Hewson, 2003); (b) the integration of specific teaching practices or pedagogy into the professional development (Foulger, 2005); (c) the engagement of participants in active learning (Boyle, Lamprianou, & Boyle, 2005); (d) collective participation of teachers from the same grades and or subject (Snow-Renner & Lauer, 2005); and (e) delivery with an extended duration (Jeanpierre, Oberhauser, & Freeman, 2005).

Continued improvement of professional development experiences for teachers relies on information from evaluation. Evaluation of teacher professional development is essential in determining how effective the professional development has been and this evaluation should be conducted on several different levels (Guskey, 2000, 2002). Guskey explained that the levels of evaluation are hierarchal in nature and should also be considered hierarchal in importance. The first and lowest level of evaluation is the measurement of participants' reactions. The second level is whether the participants learned something from the professional development experience. The third level looks at administrative support for the professional development. The fourth level determines whether participants continue to use the new information, skills, or strategies taught during the professional development program. The fifth and highest level of evaluation evaluates student achievement as a result of teacher change. Although each level of evaluation is important, the two highest levels are of utmost importance when

considering that the goal of professional development is to influence teacher instruction which results in improved student achievement (Darling-Hammond, 1998).

Agriculture in the Classroom is a National organization that furthers the efforts of agricultural literacy in elementary schools. The Utah division of Agriculture in the Classroom has developed an asynchronous online, university graduate level course titled, *Food, Land, and People* © (ASTE 6400). *Food, Land, and People* (*FLP*) provides online teacher professional development for practicing elementary school teachers throughout the state of Utah. It was developed at Utah State University by Utah Agriculture in the Classroom staff, a former classroom teacher who is now an associate professor at that institution. *FLP* was developed for K-6 educators to increase knowledge about agricultural/environmental literacy while meeting statewide mandatory curriculum standards in science, social studies and healthy lifestyles (Utah Agriculture in the Classroom, 2007). As part of this professional development experience, teachers are taught strategies to improve classroom practice and provided with lesson plans and activities to implement in their classrooms. Participants are allowed 12 months to complete the course from the time of registering. Additionally, teachers can earn re-licensure credit hours and/or university graduate level credit for successfully completing the course. This class provides the context for this research.

## Problem Statement

Although researchers agree that teacher professional development should be structured around key characteristics to be effective, most evaluations of effectiveness of

teacher professional development are only performed at the lower two levels of evaluation (participants' reactions and learning). Using the higher levels of evaluation (participant continued use and student achievement) to determine the effectiveness of professional development would more accurately assess effectiveness. There are relatively few hierarchal evaluations using levels four or five (continued use and student achievement) that have been conducted on teacher professional development. Of these few studies, many were poorly conducted and had problems such as not stating how long after the professional development they were evaluated or evaluating for continued use while the professional development was still going on. There continues to be a gap in the knowledge of whether professional development programs that are structured by the key characteristics of effective professional development really are effective in promoting long term continued use of materials and strategies from the professional development. In addition, since online delivery of professional development is a relatively new phenomenon, additional research is needed in this area as well. Thus, a study was conducted on *Food, Land, and People* (ASTE 6400), an on-line teacher professional development that is structured by the key characteristics of effective professional development to determine the extent it has produced long-term (up to 3 years) implementation of materials by its participants.

## Purpose and Research Questions

The primary purpose of this study is to determine the extent to which participants continue to use the lesson plans and activities obtained from *FLP*. This online

professional development program meets all five of the key characteristics of effective professional development as defined in the literature (Guskey, 2003a; Loucks-Horsley et al., 2003; Snow-Renner & Lauer, 2005). Evaluations previously conducted on the lower two levels (participants' reactions and participant learning) have been very positive, however it is important to evaluate *FLP* at level four (participant continued use) to determine the extent that participants have continued to use the lessons and strategies taught during the professional development program. This will be performed by creating a Sustained Implementation Scale (SIS) model that gives each participant a weighted score correlated to the amount of lessons and activities used since the professional development experience and the amount of time since taking *FLP* professional development. The following research questions guided this study:

*Research Questions*

1. With what frequency do participants continue to use the *Food, Land, and People* curriculum?
2. What is the relationship between the Sustained Implementation Scale (SIS) and participant characteristics?
3. What variables explain the variance in SIS?

*More Specific Questions*

1. How does gender relate to the SIS of participants?
2. How does the number of years teaching influence the SIS of participants?
3. How does the subject or grade level teaching influence the SIS of

participants?

4. How does the highest degree obtained by the participant influence the SIS of participants?

5. How does the type of teaching license influence the SIS of participants?

6. How does the location of the school (rural, urban) influence the SIS of participants?

7. How does the SES of the students influence the SIS of participants?

8. How does the percentage of ethnic students at the school influence the SIS of participants?

9. How does whether the school has met Annual Yearly Progress (AYP) influence the SIS of participants?

## Limitations

A limitation of this study is that the professional development being evaluated is only offered to teachers in Utah and the curriculum is specific to Utah. Therefore, results may not be generalizable to other states. Another limitation of this study is that the results of this study have been calculated using self-reported information. In addition, another limitation of this study is that the final sample sizes are below 30 resulting in non-sufficient power for the statistical analysis.

## Delimitations

This study will not evaluate participants' reactions, participants' learning,

administrative support towards professional development, or student achievement. The study will only evaluate participants' continued use of materials.

## Definitions

There are a few essential terms that need to be clearly defined: Annual Yearly Progress (AYP), asynchronous, online professional development, Social Economic Status (SES), Sustained Implementation Scale (SIS), synchronous, and web-delivered. Clear definitions of these terms will assist the reader in understanding the context in which these terms will be used.

Annual Yearly Progress (AYP) is a term specific to No Child Left Behind (NCLB) Legislation and indicates that a school is meeting specific academic requirements each year (Braun, 2005).

Asynchronous online courses are defined as courses where participants do not have to log in and work at specific times (Cole & Styron, 2006). Instead, they are free to access the course within their own time constraints and desires.

Online professional development is a term used to describe any professional development that is accessed via the internet (Littlejohn, 2002).

Sustained Implementation Scale (SIS) is a term used to classify the amount of continued use of *FLP* curriculum a participant has reported. This measurement will be created by determining the number of lessons and activities a participant has used each year and then weighting the scores (Linn & Haug, 2002). The reported number of lessons or activities used in the third year following the professional development

program will be weighted at three times the reported number of lessons or activities used. Continued use 3 years after the professional development program signifies a stronger indication of impact than someone who uses lessons immediately following the professional development. The number of lessons or activities used in the second year following the professional development will be weighted at two times the reported number used. The number of lessons and activities used in the first year following the professional development will be weighted by one times the number reported. A total SIS will be determined for each participant by summing each of the weighted scores across Years 1, 2, and 3.

Socioeconomic status (SES) will be determined by the percentage of students at the school who are eligible for reduced or free lunch (Kaplan & Maehr, 1999; Lee, Hart, Cuevas, & Enders, 2004).

Synchronous courses are the opposite of asynchronous. They require participants to log in and work from the site at specific times (Brown & Green, 2003).

Web-delivered is a term used interchangeably with online delivery. It means that information, content, or a program is accessed via the internet (Cavanaugh, Gillan, Kromrey, Hess, & Blomeyer, 2004).

## Assumptions

One assumption of the study is that participants of *FLP* chose to enroll in the course of their own accord and were not mandated by administrative personnel. A second assumption is that all participants are computer literate and able to successfully

work in an online environment. A third assumption is that the participants have their own classroom in which to implement lessons. A final assumption is that the participants have answered the survey honestly and completely.

## Importance of the Study

The main benefit of this study was to determine whether an online teacher professional development program that is structured by key characteristics of effective professional development is effective as measured by participants' continued use of materials. Although there is previous research identifying characteristics of effective professional development (Birman, Desimone, Porter, & Garet, 2000; Desimone, Porter, Garet, Yoon, & Birman, 2002; Foulger, 2005; Jeanpierre et al., 2005), few studies have effectively evaluated online teacher professional development experiences.

# CHAPTER II

# REVIEW OF THE LITERATURE

This literature review presents current research on teacher professional development. More specifically, the following aspects of professional development will be presented: (a) Traditional frameworks of professional development; (b) Delivery methods of professional development; (c) Characteristics of effective professional development programs; and (d) Evaluation of teacher professional development programs. Additionally, this review will describe the *FLP* professional development program that provides the context for this research and describes how this program satisfies the criteria for effective professional development. Finally, the review will discuss survey research, particularly online survey research.

## Framework for Professional Development

Teacher professional development has a long history (American Association of Colleges for Teachers, 1976; Bergquist & Phillips, 1975; Cochran-Smith & Lytle, 1999; Hargreaves, 2000; Hunt & Michael, 1983; Schiffer, 1978) and is often heralded as one of the most effective ways in which to impact teacher practice (Abadal-Haqq, 1995; Littlejohn, 2002; National Center for Education Statistics [NCES], 2001; Plecki, 2000; Showers, Joyce, & Bennett, 1987; Wilson & Berne, 1999).

Teacher professional development is identified by several different labels. It is known as teacher development, staff development, professional development, teacher inservice, and teacher professional development. Whatever the label, it can be defined as

those processes and activities designed to enhance the professional knowledge, skills, and attitudes of educators so that they might, in turn, improve the learning of students (Guskey, 2000).

Effective professional development results in teacher learning, transformation, and improvement that transfers to better instructional practices and ultimately leads to increased student achievement (Showers et al., 1987). Even the very best professional development program would be in vain if participants do not implement their new knowledge and expertise in their classrooms to facilitate student learning (Bredeson, 2003).

### *Traditional Teacher Professional Development Programs*

In the early days of professional development, the experience was synonymous with mandatory attendance at a lecture predetermined by the administration to take place on a teacher workday (Maldanado, 2002). The topic was not a choice of the attendees, and they were usually passive listeners whose only concern was if they would be required to implement the ideas in their classrooms. In this type of experience, invited experts are totally unfamiliar with the school dynamics and culture (Wilson & Berne, 1999). This form of instruction has given professional development a negative image. Instruction can be an effective tool if it is planned and delivered in a way that engages and empowers teachers (Gordon, 2004).

*Teacher workshop.* District/school inservice workshops are the most often used form of teacher professional development and are often referred to as “drive-by

workshops" (Darling-Hammond, 2000; Maldanado, 2002; Rebora, 2004). Professional development offered as inservice workshops normally lasts between one to three days and is usually conducted by a content specialist such as a college professor or independent consultant. The typical inservice is delivered face-to-face and is supplemented by handouts and interactive activities. Research has shown that this type of professional development fails to have lasting effects and leaves teachers unprepared for the classroom (Corcoran, 1995; Darling-Hammond; Hawley & Valli, 1999; Lewis et al., 1999; Maldanado; Mullens, Leighton, Laguarda, & O'Brien, 1996; Rebora).

*College courses.* Many teachers receive professional development in the form of college courses. College courses normally last 3 to12 months and are most often delivered face-to-face. In addition to lectures, college courses typically have supplemental readings, activities, and research components (Fink, 2003). In a study conducted by Boyle, While, and Boyle (2004), 34% of teachers reported that they had received professional development in the form of a college course.

*Seminars.* Seminars are another form of professional development. They are very similar to workshops because they are facilitated by a speaker(s) in a face-to-face format. They are normally more interactive than workshops because participants are expected to discuss ideas and thoughts (National Science Teacher Association, 2007). Seminars are usually conducted in short durations allowing participants to meet briefly to share information.

Traditionally used formats and delivery methods of teacher professional development are summarized in Table 1.

Table 1

*Traditionally Used Professional Development Programs*

| Format | Delivery mode |
|---|---|
| Teacher workshop | Face-to-face, lecture, printed materials |
| College course | Face-to-face, lecture, printed/visual material/video |
| Seminar | Face-to-face, discussion, printed materials |

## *Professional Development Programs in Use Today*

A recent form of professional development is called communities of practice (Hara, 2001). This type of professional development experience involves informal networks designed to support a group of learners in developing a shared meaning and engaging participants in the construction of knowledge (Hara; Hord, 1997; Salpeter, 2003; van Driel, Beijaard, & Verloop, 2001). Wegner (1998) defined communities of practice as the social fabric of learning, where participants collectively negotiate meaning, preserve and create knowledge, and spread information. This type of professional development has traditionally been delivered in a face-to-face format.

Other forms of professional development commonly used today in educational settings are coaching, mentoring, small learning communities, and networking (Hord, 1997; Morrissey, 2000; van Driel et al., 2001). These forms of professional development each focus on participants working and interacting with participants similar to themselves and are delivered face-to-face.

### *Change in Delivery*

Most teacher professional development models have traditionally been delivered

face-to-face. In face-to-face settings, participants and presenters have varying degrees of personal interaction. Each is able to see and hear each other. This delivery method allows presenters to easily adapt to and work with the current situation (Nikolova & Collis, 1998). If a presenter senses confusion among the participants, it is possible to instantly clarify information and address the situation immediately.

More recently, delivery methods have begun to change (Derry et al., 2005). Delivery methods now commonly include satellite courses and audio/video teleconference (McLendon & Albion, 2000). These delivery methods provide less personal interaction than traditional face-to-face delivery, but allow more people to participate. Although less personal, each of these delivery methods still allows participants and presenters to interact with each other in real-time. It is still easy to ask questions and receive immediate feedback. In some delivery methods, such as satellite delivery, the participants are able to see the presenter(s), but the presenter(s) is not able to see the participants. These delivery methods are designed synchronously whereas they still require that participants and presenters all meet at certain times and in certain locations.

The popularity of the Internet in the mid 1990s has opened up yet another delivery method for professional development, online professional development. Despite not having personal interaction, online professional development has grown in popularity (Hodgson, 2002; Littlejohn, 2002; Young, Chan, & Lin, 2002). Professional development schools, colleges and universities, and other professional development agencies have all began to offer professional development provided either partially or

completely online.

*Online Delivery*

As society becomes more technologically literate, more people are turning to the internet as a source to receive training and further learning. Advances in technology have allowed teacher professional development experiences to be offered online. Unlike traditional professional development, asynchronous web-delivered professional development allows participants to log on and participate at the time of day that is best for them and at a comfortable pace (Cole & Styron, 2006). This eliminates instruction dictated by rigid schedules and time-frames because web-delivered staff development is available 24 hours a day, 7 days a week (Bintrim, 2002).

Online professional development has the added advantage of easy accessibility. As long as participants have access to the internet, they are able to log on and work from any geographical location. Additionally, web-delivered professional development has an added incentive because overhead costs (buildings, furniture, and utilities) are reduced and often eliminated as professional development facilitators no longer need a building for participants to receive the professional development (Brown & Green, 2003).

Early evaluations of online professional development have found that participants enjoy taking professional development via the internet (Cavanaugh et al., 2004; Cole & Styron, 2006). Additionally, many teachers prefer online professional development over more traditional methods (Cavanaugh et al.).

Despite many advantages of online delivered professional development, there are still people who prefer the traditionally delivered face-to-face professional development.

Several reasons for hesitancy to adopt the new delivery styles exist. Some of the stated reasons include “faceless” teaching, lack of adequate time-frame to complete courses, resistance to change, lack of technological assistance and skills, and lack of independent learning skills (Berge, 1998; McLendon & Albion, 2000; Newton, 2003).

## Key Characteristics of Effective Teacher Professional Development

Research in teacher professional development has identified key characteristics of effective professional development. Guskey (2000), a leading researcher in the evaluation of professional development, performed a meta-analysis on the characteristics of effective professional development. He did a synthesis of 13 studies from 1995 through 2002 that identified key characteristics of effective teacher professional development. The studies he reviewed had lists of key characteristics ranging from 6-16 varying characteristics. Guskey was trying to answer specific questions: Were the lists derived in comparable ways, and did specific characteristics appear on all of the lists?

The results from this synthesis indicate that key characteristics are applicable to teacher professional development regardless of the year they were conducted. It is important to recognize that this synthesis only covers a seven year period, and although the time period is relatively short, there was a significantly important event that occurred during the latter end of the time frame; the introduction of NCLB Legislation that occurred in 2000. Even with NCLB, there were not any significant changes in the types of characteristics thought to be important in professional development.

Guskey summarized the key characteristics of effective teacher professional

development in each study. His synthesis begins with the characteristic most often cited as important and works down to the characteristics least cited. Additionally, his hierarchal list from most to least cited is matched with the studies that cite the particular characteristic.

The characteristic most often cited as being important, particularly in professional development for science teachers, is having professional development that focuses on teachers' content and pedagogical knowledge. This means that effective professional development enhances the participant's academic content knowledge and provides training in specific teaching strategies.

The next highest reported characteristic was having sufficient duration. Participants of longer (20+ hours) professional development programs felt that the professional development was more effective than participants who had experienced fewer hours of professional development.

Third on the list were teacher professional development programs that promote collegiality and collaboration. These professional development programs were structured so that teachers from the same schools, grade levels, or subject matter were able to interact with each other.

The fourth highest area was having an evaluation component built into the professional development. Participant feedback on activities during the professional development was the most often used form of evaluation.

The fifth area was professional development programs that were reform based. Traditional professional developments rarely had participants actively engaged in

activities or pedagogical practice. Today, professional development experiences that provide activities and practice are considered reform based. These professional development programs are ones that actively involve the participants in activities and teaching strategies.

Sixth was modeling high-quality instruction. Professional development programs that provided instructors who were able to skillfully demonstrate teaching strategies received higher reviews of effectiveness.

After these, the responses were so few and scattered that they will not be mentioned individually, but can be viewed in Table 2. This table is reconstructed from another dissertation on professional development (Edmondson, 2006).

Although Guskey's (2000) review was thorough, this review of the literature extends the chronological timeframe. The goal was to determine if perceptions would change with time. Guskey demonstrated that there were not significant changes between 1995 and 2002, but the objective of the extension of the timeframe was to verify whether NCLB and the call for higher accountability would change what was deemed important for professional development several years after the legislation.

Key word searches in ERIC, Dissertation Abstract summaries, EBSCOHOST, and Google Scholar were used to locate an additional ten studies that identified key characteristics of professional development. The search was limited to studies published between 2000 through the current year 2008. In this way, the search was conducted to look for any changes in the lists of key characteristics of professional development influenced by events such as NCLB.

Table 2

*Frequency of Characteristics of Effective Teacher Professional Development*

| Characteristic/trait | Number of lists citing trait (out of 13) |
|---|---|
| 1. Enhances teachers' content and pedagogical knowledge | 11 |
| 2. Provides sufficient time and other resources | 10 |
| 3. Promotes collegiality and collaboration | 9 |
| 4. Includes procedures for evaluation | 9 |
| 5. Aligns with other reform initiatives | 8 |
| 6. Models high-quality instruction | 7 |
| 7. Builds leadership capacity | 6 |
| 8. Based on "teachers'" identified needs | 6 |
| 9. Driven by analysis of student learning data | 6 |
| 10. Focuses on individual and organizational improvement | 5 |
| 11. Includes follow-up and support | 5 |
| 12. Is ongoing and job-embedded | 4 |
| 13. Based on best-available research evidence | 3 |
| 14. Takes a variety of forms | 2 |
| 15. Provides opportunities for theoretical understanding | 2 |
| 16. Helps accommodate diversity and promote equity | 3 |
| 17. Driven by an image of effective teaching and learning | 1 |
| 18. Provides for different phases of change | 1 |
| 19. Promotes continuous inquiry and change | 1 |
| 20. Involves families and other stakeholders | 1 |

There is a certain difficulty in finding a common metric by which to evaluate studies on the key characteristics of teacher professional development. Guskey (2000) mentioned that often the authors of a study do not specify how they came up with their list of key characteristics. In the review of literature, it was found that often the lists of characteristics were derived through participant surveys (Desimone et al., 2002; Snow-Renner & Lauer, 2005). The teachers would self-report what they felt were the most important characteristics of the professional development and then the investigator linked those reports with professional development effectiveness. Standards of effectiveness

have not been set, thus the lists are anecdotal at best. Some studies were even harder to measure as they did not specify any particular criteria (Loucks-Horsley et al., 2003). The most useful research studies made lists of traits of effective professional development as measured by changes that teachers made in their practices either during or after the professional development program (Boyle et al., 2005; Desimone et al.; Goodwin, 2005; Jeanpierre et al., 2005; Supovitz & Turner, 2000). All three criteria were used for the selection of research studies. First preference was given to studies that used teacher change as a criterion when determining the key characteristics. Second, articles were used that surveyed their participants to determine the key characteristics, and third, author generated or anecdotal characteristics were allowed only from authors who are well-known and considered experts in the field of teacher professional development such as Loucks-Horsley and colleagues (2003).

The studies had lists with as few as three characteristics and as many as seven characteristics. Nine different characteristics were mentioned in the studies. Results were very similar to those that Guskey (2003b) obtained. Whereas, Guskey identified six key characteristics, this review of additional literature can be summarized into five main categories: (a) focusing on content and/or pedagogical knowledge; (b) integrating information from professional development with participants' classroom experiences; (c) providing opportunities for active participation with feedback for each participant; (d) providing collaboration of participants from the same school, grade level, or subject matter; and (e) Having an extended duration. Table 3 shows the important characteristics for an effective professional development program in the extended review of literature.

Table 3

*Characteristics of Effective Teacher Professional Development*

| Characteristic/trait | | Number of lists citing trait (out of 13) |
|---|---|---|
| 1. | Focusing on content and/or pedagogical knowledge | 9 |
| 2. | Integrating information from the professional development with participants' classroom experiences | 9 |
| 3. | Providing opportunities for active participation | 9 |
| 4. | Providing collaboration of participants from the same school, grade level, or subject matter | 7 |
| 5. | Having an extended duration | 6 |
| 6. | Providing an assessment section | 1 |
| 7. | Provides opportunities for the teacher to be a leader | 2 |
| 8. | Addresses the teachers individual needs | 1 |

Guskey's (2003b) meta-analysis and this extended review of the literature found consensus on characteristics researchers have determined to be important for professional development to be effective. This review of the literature supports Guskey's meta-analysis. The authors of the studies found content knowledge, duration, and collaboration to be key characteristics of professional development. It was initially thought that the lists were different after those three points, but with careful review, it was found that both shared other similarities referred to by different names. Guskey's meta-analysis reported the importance of reform-type professional development, but does not specify what reform-type professional development is. The studies in the extended review of the literature add clarity to what reform-type professional development is. They suggest that reform-type professional development programs include techniques which involve participants in the professional development process (Loucks-Horsley et al., 2003).

Reform characteristics are embedded in active participation and integrated lessons. Evaluation is now considered important in the form of feedback to the participants after they have been actively engaged in some part of the professional development process.

It appears that the key characteristics of effective professional development from 1995-2005 remain consistent. The extended review of the literature adds clarity as to certain characteristics and further refinement as to what is needed for effective professional development.

*Content and Pedagogical Knowledge*

Research suggests that professional development programs need to focus on the enhancement of teacher's content and pedagogical knowledge to make the professional development effective (Boyle et al., 2005; Foulger, 2005; Jeanpierre et al., 2005; Loucks-Horsley et al., 2003; Meier, 2005; National Staff Development Council, 2001; Snow-Renner & Lauer, 2005; Supovitz & Turner, 2000). This is especially true for elementary school teachers because they often lack the depth of knowledge of certain specific subject knowledge such as science (Cohen & Hill, 2000). The premise is that by strengthening the teachers' knowledge they will be more comfortable and competent in teaching their students, thus improving student achievement.

*Implementation*

The literature suggests that participants need to understand how specific subject matter from professional development can be implemented into their practice (Birman et al., 2000). It cannot be assumed that participants will naturally and independently make

the connection between professional development content and implementation into their classroom. If teachers are not able to implement information from a professional development program, the professional development activity can be considered ineffective at a very fundamental level.

*Active Learning*

Active learning is similar to implementation with a few major differences. First, it is not enough for participants of professional development programs to only see how to implement information from the professional development activities into their classrooms; they need to have opportunities to practice using the information during the program (Snow-Renner & Lauer, 2005; Supovitz & Turner, 2000). Second, as participants practice implementing the information, they need to receive feedback to help them improve and feel more comfortable with the new materials or information (Butler, 1992; Saylor & Kehrhahn, 2003; Showers et al., 1987).

*Collective Participation*

Teachers are often isolated from others like them. Although schools have many teachers, isolation is created by differing lunch periods, preparation schedules, subjects they are teaching, and very busy schedules. Teachers often find it difficult to make time to interact and gain strength from each other during a regular working day (Dearman & Alber, 2005; Sternberg, 2006). Teachers need opportunities to build collegiality and share experiences with each other. Professional development that focuses on specific grade levels, school locations, or subject matter provides these opportunities for

collective participation of teachers. It is during these programs that similar teachers are able to interact, share experiences, discuss teaching strategies, and strengthen each other in their efforts at being effective teachers.

*Duration*

Most of the studies in this review of the literature have suggested that professional development needs to have at least 40 contact hours to be effective (Boyle et al., 2005; Jeanpierre et al., 2005; Meyer & Barufaldi, 2003). Contact hours are provided in a variety of ways. Some professional development programs offer the contact hours in a week time period, while others extend the professional development anywhere from two weeks to two years. Having an extended duration is an important component of effective professional development for several reasons. First, participants need ample time to practice and work with new information and skills presented at a professional development (Guskey, 2003a). Second, professional development that has an extended duration is typically more grounded in subject and content knowledge (Birman et al., 2000). Professional development programs that are designed as a one-shot approach do not provide enough time during or after the program to be considered effective.

## Evaluation of Professional Development

It is essential to evaluate professional development because without evaluation, it is impossible to determine whether the professional development is effective and should continue. Effective evaluation provides a base to ascertain needed changes and additional needs of the professional development (Bredeson, 2003; Elmore, 2002;

Guskey, 2000, 2002; Tallerico, 2005).

Guskey suggested that teacher professional development should be evaluated on a five step hierarchal system (Guskey, 2000, 2002). The levels of evaluation, beginning at the lowest are: (a) measuring participants' reactions; (b) participants' learning; (c) organization support and change; (d) participants' use of new knowledge and skills; and (e) student learning outcomes.

Measuring participants' reactions to the professional development is the first and lowest level of evaluation. It looks simply at how the participants felt about the professional development program. Short surveys or questionnaires distributed at the conclusion of the professional development program will determine whether the participants liked the professional development program. This level of evaluation is the most often used, mainly because designers and providers of professional development can get a quick look at the participant's attitudes toward the professional development program.

It is not enough for participants to have a positive attitude about their professional development experience; they need to learn something from it (Guskey, 2000, 2002). Acquiring new knowledge or skills is important because these can be transferred to student learning. Evaluating exactly what the participants learned will also allow designers of professional development programs to determine whether the goals and objectives of the professional development program have been met. Ideally, professional development programs are intended to influence participants' ideas or teaching practices. It is important to determine whether participants have been influenced and gained the

desired professional development outcomes.

The third level of evaluation is organization support and change. Many professional development programs are presented to entire schools or school districts. In circumstances such as these it is important to evaluate whether the administration has bought into the adoption of the presented ideas or strategies. Financial and time constraints can make it very difficult for individual teachers to make certain changes in their practices without the support of administration (Guskey, 2000, 2002).

Professional development programs are designed to teach new content knowledge, pedagogical skills, and other instructional practices. It really does not matter how good the professional development activity is if the participants do not use what they have learned. Use of new knowledge cannot be adequately measured during or immediately after a professional development, as participants need time to reflect and internalize the information (Darling-Hammond, 1998; Lieberman & Wilkins, 2006). Participants' continued use of new knowledge and skills leads to higher student outcomes. Evaluation of the participants' student learning outcomes is another way to determine the effectiveness of a professional development program as it focuses on the extended outcomes of the professional development (Corcoran, 1995). It is important to measure improvements in students' academic achievement, attitudes or perceptions, or behaviors (Bredeson, 2003; Darling-Hammond, 1998; Pink & Hyde, 1992). Student learning outcomes are often considered the most important evaluation that can occur after a teacher professional development program (Elmore, 2002; Guskey, 2000, 2002).

*Theory Versus Practice: A Disconnect*

Although consensus exists regarding effective teacher professional development practices and methods for evaluating them, the majority of studies reporting what constitutes an effective professional development activity have only measured levels one and two (participants' reactions and participants' knowledge; Lethwaite, 2005; Orrill & Intermath-team, 2006). These lower levels of evaluation are not sufficient for determining the effectiveness of professional development programs.

The researcher searched the literature for studies of teacher professional development and the evaluation criteria. The search included the ERIC database, Dissertation abstracts, EBSCOHOST, and Google Scholar for any study on teacher professional development between 2000 and 2007. A systematic procedure was used to evaluate each study. There are 26 studies for comparison.

Each study was evaluated according to the presence of the five key characteristics of effective teacher professional development as explained earlier in the review of the literature. Each study had to have clear indication that the professional development was structured by all five key characteristics. If they were structured by the five characteristics, then it was grouped by the type of evaluation performed. The types of evaluation were divided into the following categories: (a) participants' reactions, (b) participants' learning, (c) participant use of material during the professional development, (d) participants' use of material after the professional development, and (e) student achievement (Bredeson, 2003; Guskey, 2000, 2002; Lieberman & Wilkins, 2006; Tallerico, 2005).

*Participants' Reactions and Learning*

Evaluating participants' reactions to professional development normally is conducted by the facilitators of the professional development and is done near the end or immediately following the professional development event. In 11 of the studies, the authors mentioned evaluating the participants' reactions to the professional development (Boyle et al., 2004; Gibson & Skaalid, 2004; Keer & Verhaeghe, 2005; Lethwaite, 2005; Lowden, 2005; Orrill & Intermath-team, 2006; Shulman & Armitage, 2005; Supovitz & Turner, 2000; Truscott & Truscott, 2004; Weiss, Banilower, Crawford, & Overstreet, 2003; Wells, 2007). None of the studies provided detail regarding measurement of participant reaction, only that they did it. Most of the studies used participant reactions as a base to compare against other levels of evaluation. Ten out of the 11 studies that measured participants' reactions also measured one or more other factors such as participants' learning, use of material during the professional development, use of material after the professional development, or student achievement. One study (Gibson & Skaalid) measured only whether the participants enjoyed the professional development. Table 4 provides an easy view of the 26 studies and shows the levels of evaluation conducted.

Fifteen studies looked at participants' learning as measured by pre/post tests and surveys. All of these studies included one or more other areas of evaluation in addition to the participants' learning. The investigators in these studies used participant learning as a stepping stone for further and more meaningful evaluations of participant use and/or student achievement. All 20 of the 26 studies either looked at participants' reactions,

Table 4

*Review of the Literature Studies and the Evaluations Conducted*

| | Level of evaluation | | | | |
|---|---|---|---|---|---|
| Author(s), year of publication | Participants' reactions | Participants' learning | Use of materials after PD | Use of materials during PD | Student achievement |
| Allen (2006) | | x | | | x |
| Boyle et al. (2004) | X | | 3 | | |
| Brinkerhoff (2006) | | x | | x | |
| Chesswas, Keir, Leung, & Terada (2005) | | x | 3 | | |
| Garet, Porter, Desimone, Birman, & Yoon (2001) | | x | 1 | | |
| Gibson & Skaalid (2004) | X | | | | |
| Hofstein, Carmeli, & Shore (2004) | | x | 2 | | |
| Howland & Wedman (2004) | | | | x | |
| Hughes, Kerr, & Ooms (2005) | | | | x | |
| Keer & Verhaeghe (2005) | X | | | | x |
| Keller, Bonk, & Hew (2005) | | | 1 | | |
| Kimble, Yager, & Yager (2006) | | x | 2 | x | |
| Kopecky (2005) | | x | | x | x |
| Lethwaite (2005) | X | x | | x | |
| Lowden (2005) | X | x | 3 | | |
| Mistretta (2005) | | | | x | x |
| Morrow & Casey (2004) | | | | x | |
| Mouza (2006) | | x | | x | |
| Orrill & Intermath-team (2006) | X | x | | x | |
| Shulman & Armitage (2005) | X | | | x | x |
| Supovitz & Turner (2000) | X | x | 1 | | |
| Timperley & Phillips (2003) | | x | 2 | | x |
| Truscott & Truscott (2004) | X | x | | x | |
| Weiss et al. (2003) | X | | 3 | | |
| Wells (2007) | X | x | | x | |
| Yore, Anderson, & Shymansky (2005) | | | | x | |

*Note.* 1= 1-12 months after PD, 2 = 1 year or more after PD, 3 = no specified time.

participants' learning, or both. The amount of evaluation at the lower two levels is consistent with past research (Guskey, 2000, 2002).

*Continued Use of Materials*

Professional development programs should be evaluated at all five levels. Professional development programs should be evaluated by whether participants use the material or content that was taught during the professional development (Darling-Hammond, 1998). This is currently not being done in most professional development programs. Fourteen of the studies attempted to measure participant use, but they measured it during the professional development. Only one study (Kimble et al., 2006) measured use of program ideas during and after the professional development. The other 13 evaluated participant use while the professional development was in progress. While it is understandable that investigators wanted to ensure participants were using the material from the professional development activities, but use during the program does not ensure use after the professional development program. Teacher professional development programs structured with participant active participation and feedback have built in mechanisms to ensure participants use the information during the professional development. It is more important to see whether participants are using the information after the professional development.

Ten studies measured participants' use of materials after the professional development event. Two of these (Garet et al., 2001; Keller et al., 2005) studies were conducted between 1 and 3 months following the professional development. Both of these evaluations were conducted through surveys. The participants self reported that

they had incorporated information and materials from professional development programs they had attended into their teaching practices.

Four other studies (Boyle et al., 2004; Chesswas et al., 2005; Lowden, 2005; Weiss et al., 2003) stated that they measured participants' use, but did not indicate the amount of time after the professional development it occurred. They may have actually measured use during the professional development. Again each one of these studies relied solely on survey instruments and participant self-report of use.

Four studies (Hofstein et al., 2004; Kimble et al., 2006; Supovitz & Turner, 2000; Timperley & Phillips, 2003) attempted to evaluate participant use one year or later after the professional development. Two of these relied completely on survey instruments and self-reports of change. The other two studies (Kimble et al.; Timperley & Phillips) came the closest to performing effective evaluations. The study conducted by Kimble and colleagues used a survey instrument followed by interviews and observations of the participants during and after the professional development. The study performed by (Timperley & Phillips) has the most comprehensive evaluations. They relied upon survey instruments, but also followed up the surveys with participant interviews. Additionally, they measured student achievement. A limitation of this study is that the authors of the study indicate they do not know exactly what caused the changes in the student achievement. It may or may not have been the professional development.

*Student Achievement*

Six studies (Allen, 2006; Keer & Verhaeghe, 2005; Kopecky, 2005; Mistretta, 2005; Shulman & Armitage, 2005; Timperley & Phillips, 2003) evaluated student

achievement. Two of the six studies evaluated student achievement in addition to either participant reaction or learning. Another three studies evaluated student achievement and participant use of information during the professional development activity. Only one study (Timperley & Phillips) evaluated student achievement and participants' use of information after the professional development program.

Evaluation of student achievement should not be the sole determinant on the success of a professional development because there are too many other variables that could be responsible for the changes in student achievement (Fletcher & Barufaldi, 2002; Shymansky, Yore, Anderson, & Hand, 2001). Comparing participants' use of information after the professional development with student achievement is the most powerful way to correlate use with achievement.

## Food, Land, and People

January 2003 marked the inception of *Food, Land, and People* (ASTE 6400) as an official Utah State University graduate course. *FLP* is an asynchronous online course that has been developed by Utah Agriculture in the Classroom staff. The staff consists of practicing and former K-12 teachers, a Utah State University Extension Education associate professor, and other support personnel. The curriculum is designed for K-6 educators with a primary purpose to increase teachers' and students' knowledge about agricultural/environmental literacy. The curriculum is designed to meet statewide mandatory standards in science, social studies and healthy lifestyles. The course content provides teachers with lesson plans to implement in their classrooms and is complete

with implementation strategies for teaching language arts and mathematics. The course is offered as a Pass/Fail grading system where teachers may earn 1-3 Utah State University semester credit(s). *FLP* is designed as an asynchronous on-line independent study course. Enrollees may take up to one year to complete course requirements (Utah Agriculture in the Classroom, 2007).

Before participants are allowed to enroll in *FLP*, they are required to attend an on-site orientation workshop. The workshop is designed to increase participants' specific content knowledge in agricultural related science, social studies, and healthy lifestyles content. Additionally, teachers receive training in using the pedagogical practices they will need to effectively implement lessons and activities in their classrooms. Upon completion of the workshop, teachers receive a certificate documenting training for teacher re-licensure credit and are then allowed to register for *FLP* (ASTE 6400).

Participants of *FLP* have access to numerous classroom resources including science kits, bulletin board display materials, DVDs/videos, books, software, maps, and lesson plans on a variety of topics such as soils, seeds, plants, animals, heredity, microorganisms, geography, nutrition, and ancient world foods. In addition to meeting state guidelines, the resources are designed to promote environmental awareness, critical thinking, problem-solving skills, cooperative attitudes, and an appreciation for cultural differences.

Participants who successfully complete *FLP* should be able to explain how agricultural concepts (soils, plants, animals, production, economics, microorganisms and food science, weather, agricultural technology) are integrated into state standards for

science, social studies and healthy lifestyles. Additionally, they learn to identify scientific advances that have changed cultures and societies and explain why agriculture is as important today as it was 100, 1,000, or 10,000 years ago. They will also learn how to implement several instructional strategies including hands-on inquiry methods.

The number of credits earned are determined by: (a) number of completed projects; (b) number of hours spent in classroom instruction using the materials and completed journal forms; and (c) completion of a final strategy report which requires the participants to reflect upon their experiences with *FLP* and outline a plan for future implementation of *FLP* curriculum. Table 5 shows the minimum requirements for each credit hour.

Every participant, regardless of the number of credits registered for, is required to complete a project. This required project is helpful in letting the facilitator get acquainted with the participants and personalize future student/instructor interactions. Participants are required to visit the *Faculty Room* section of the course and identify at least one tip or idea they think is useful. Next, they must send an email message to the instructor letting him/her know which tip or idea they liked. In the message, they need to introduce themselves, including their name, the school name where they teach, some of

Table 5

*Food, Land, and People Course Requirements and Credit Hours Received*

| Credit(s) | Projects | Classroom instruction hours | Final strategy report |
|---|---|---|---|
| 1 | 2 | 8 | Required |
| 2 | 3 | 18 | Required |
| 3 | 4 | 28 | Required |

the school's demographics, the grade level they teach, and anything else they want to share.

After completion of the required project, participants choose additional projects to complete, the number being dictated by the number of credits registered for. For each additional project they complete, the participant is expected to email the instructor and at least two other teachers explaining their teaching tips or ideas. This component encourages participant interaction not only with the instructor, but with other teachers as well. Participants are able to design their own projects or choose from a list of other acceptable items. Appendix A shows the provided list.

In addition to the projects, teachers are expected to complete a minimum number of classroom instruction hours using *FLP* curriculum. Participants are able to choose from a variety of science, social studies, or healthy lifestyle lesson plans for the grade they teach. Each lesson plan comes with additional enrichment activities, and each lesson is tied to Utah standards and objectives. After completing a lesson or activity, participants submit an online journal form to the class instructor. The online journal form has participants list the lesson plan title, number of instructional hours spent delivering the lesson, strengths of the lesson and/or improvement suggestions, what additional activities were used, integration strategies or other resources utilized with the lesson, and an explanation of the evidence that the students understood the standards/objectives or Intended Learning Outcomes of the lesson plan.

The culminating activity for *FLP* participants is a final strategy report. This report asks participants to outline their strategy for implementing *FLP* and Agriculture in

the Classroom concepts, lesson plans, and activities into their classroom in the future. Each of the above *FLP* course assignments can be viewed in Appendix B.

## FLP and Key Characteristics of Effective Professional Development

The *FLP* course is structured by the five key characteristics of effective professional development. The following section will identify specifically how each characteristic is met.

### *Content and Pedagogy*

Research suggests providing specific subject content and pedagogical skills in teacher professional development is one of the key characteristics of effective professional development (Boyle et al., 2005). Effective professional development should provide teachers with opportunities that help them learn and better understand curricular content.

Participants of *FLP* receive specific content training during the on-site orientation. Additionally they receive content information by completing some of the project ideas such as the selected Reading Project or the website review as shown in the course syllabus in Appendix B.

Participants receive instruction on pedagogy several ways from *FLP*. Pedagogy is one of the main topics addressed during the onsite orientation. Participants are required to reflect and share their teaching experiences with the instructor and other teachers as part of the projects they have to complete. Additionally, at the completion of each lesson taught using *FLP* curriculum, the participants fill out a journal form where they describe

implementation strategies and evidence that their students understood the objectives or intended Learning Outcomes of the lesson as defined as the skills and attitudes in the Utah Core Curriculum.

*Integrated into the Curriculum*

Effective teacher professional development needs to provide participants activities and training that are integrated into the curriculum the teachers use. *FLP* has a built in mechanism to have its participants implement course content into their classrooms and curriculum.

The *FLP* syllabus details its course requirements, see Appendix B. The following is an excerpt from the course requirement section, "Lesson plans, activities, and other classroom resources available on the course website will be used to complete the classroom instruction hours" (Utah Agriculture in the Classroom, 2007). Participants are able to choose which lesson plans, activities, and other resources they will use to complete their required classroom instruction hours. As participants work to meet course requirements, they are also teaching their students with *FLP* curriculum

*Active Learning*

Teachers need opportunities to practice or use the skills or ideas presented during a professional development experience (Jeanpierre et al., 2005). Providing opportunities for active learning helps teachers gain confidence and security in using new ideas, strategies, or curriculum. Participants have opportunities to practice some of these lessons on other participants during the on-site orientation portion of the professional

development, then later as part of *FLP*, participants are required to implement lesson plans provided during the course with their own elementary students. Participants are not assigned to teach any certain number of lessons, rather they are required to complete a minimum number of instruction hours. Each lesson plan normally requires 1-10 hours of instruction time.

Upon completion of each lesson, participants complete a journal form. The journal form requires the following information to be completed: (a) lesson plan title; (b) number of classroom instructional hours spent on this lesson; (c) number of students in the classroom; (d) strength of the lesson and/or improvement suggestions; (e) additional classroom activities conducted; and (f) integration strategies or other resources used with the lesson. The required journal form documents that participants have used the new curriculum and activities. Additionally, participants are expected to reflect on their experience using it and describe its strengths and weaknesses.

*Collaboration*

Collaboration among participants from the same school, grade level, or subject taught is considered another important characteristic of effective professional development.

Participants of *FLP* receive several opportunities for collaboration with other teachers. The first time participants collaborate is during the on-site orientation where they meet at a localized spot to be instructed and discuss *FLP*. Another way that participants are able to collaborate is through website's *Faculty Room*. This is an online environment where participants share ideas or tips about teaching using the *FLP*

curriculum. Participants are required to post ideas and/or teaching strategies in the *Faculty Room*. Participants are expected to post ideas or tips a minimum of four times to the *Faculty Room* depending on the number of credit hours registered for.

The *Faculty Room* is divided into nine sections: special education, music education, kindergarten, first grade, second grade, third grade, fourth grade, fifth grade, and sixth grade. This format allows teachers of specific subject matter or grade level to interact with other teachers similar to themselves.

*Extended Duration*

Many studies suggest that professional development needs to provide participants at least 40 contact hours to be effective (Boyle et al., 2005; Jeanpierre et al., 2005; Meyer & Barufaldi, 2003). Participants who take *FLP* exceed the 40 hour minimum. Table 6 shows the number of contact hours *FLP* participants receive.

Table 7 depicts how *FLP* meets each of the key characteristics thought to be important for effective professional development.

Table 6

*Food, Land, and People Contact Hours*

| Activity | Estimated contact hours |
|---|---|
| Onsite orientation | 3 |
| Projects | 10 |
| Classroom instruction | 28 |
| Final strategy report | 10 |
| Total hours | 51 |

Table 7

*Food, Land, and People and Key Characteristics of Effective Professional Development*

| Characteristic | Food, land, and people components | |
|---|---|---|
| Specific content or pedagogy | Onsite orientation<br>Project ideas<br>Reflection journals | |
| Integrated into curriculum | State aligned less plans in:<br>Science<br>Social studies<br>Healthy lifestyles | |
| Active learning | Documented instruction hours<br>Curriculum integration | |
| Collaboration | Onsite orientation<br>Faculty room postings<br>Emailing teaching tips | |
| Extended duration | Onsite orientation<br>Classroom instruction<br>Projects<br>Final strategy report | 3 hours<br>28 hours<br>10 hours<br>10 hours |

## Internet Survey Research

Surveys are a widely used form of data collection (Gay & Airasian, 2000). They are effective in reaching participants in a large demographic area and in a more expedient and less expensive manner than other forms of data collection (Borg & Gall, 1989). The internet and e-mail revolution has prompted many researchers to switch from paper surveys to electronic surveys (Dillman, 2007).

Computer and internet familiarity has grown exponentially over the past few years. Dillman (2007) explained that today nearly two thirds of U.S. households have internet access in their homes. The ease of navigating the internet and using e-mail has

provided a new avenue for conducting survey research (National Research Council, 2003; Schonlau, Fricker, & Elliott, 2002).

Response rates for electronic surveys are slightly lower than traditional paper-based surveys (Kaplowitz, Hadlock, & Levine, 2004). Acceptable response rates for electronic surveys is between 20-50% (Dillman, 2007; Heerwegh, Vanhove, Matthijs, & Loosveldt, 2005; Kaplowitz et al., 2004; Manfreda, Bosnjak, Haas, & Vehovar, 2005; National Research Council, 2003; Schonlau et al., 2002; Simsek & Veiga, 2000). Despite electronic response rates being lower, researchers can employ specific actions and techniques to increase response rates. Personalizing email is one way to increase electronic response rates. Sending e-mail to each participant separately, not using CC or putting every participant in the address bar, and personalizing cover letters has increased response rates by as much as 8.6% (Heerwegh et al.).

Using alternative follow-up methods has also been shown to increase response rates. After one or two e-mailed follow-up letters to non-responders, it is sometimes helpful to send a traditional paper based letter and survey to get a response (Dillman, 2007).

*Survey Demographics*

Collecting appropriate demographic questions is essential in good survey design (Schonlau et al., 2002). Participants quickly tire and become frustrated with poorly written and seemingly long lists of survey questions, thus it is essential to only use questions that are pertinent and helpful to your study (Fink & Kosecoff, 1998). Additionally, certain types of demographic data in educational arenas such as school size,

and the percentage of students on free or reduced lunch, can often be collected through personal research without causing participants to become laden with unnecessary questions.

There are several demographical items that are related directly to the teacher that can be asked with a survey instrument. The first is teacher gender (Brinkerhoff, 2006; Garet et al., 2001; Howland & Wedman, 2004; Keer & Verhaeghe, 2005; Mistretta, 2005; Morrow & Casey, 2004; Supovitz & Turner, 2000; Truscott & Truscott, 2004). Male and female teachers often work differently and make different instructional choices.

The number of years teaching experience is another demographic variable that is often collected (Brinkerhoff, 2006; Garet et al., 2001; Hofstein et al., 2004; Lowden, 2005; Mistretta, 2005; Morrow & Casey, 2004; Supovitz & Turner, 2000; Truscott & Truscott, 2004). Additionally, information is often collected on the subject they teach (Boyle et al., 2004; Brinkerhoff; Garet et al.; Howland & Wedman, 2004; Hughes et al., 2005; Keller et al., 2005; Orrill & Intermath-team, 2006; Truscott & Truscott, 2004; Weiss et al., 2003) and the grade level taught (Boyle et al.; Brinkerhoff; Gibson & Skaalid, 2004; Hughes et al.; Keer & Verhaeghe, 2005; Keller et al.; Kimble et al., 2006; Lowden; Mistretta; Morrow & Casey; Orrill & Intermath-team; Shulman & Armitage, 2005; Supovitz & Turner; Timperley & Phillips, 2003; Truscott & Truscott; Weiss et al.; Wells, 2007). The research suggests that teachers of different grade levels and subjects are likely to select different curriculum.

There are other demographics that may be equally important as the prior demographic questions but not as often reported. Some studies reported data on the

teachers highest degree obtained (Gibson & Skaalid, 2004; Morrow & Casey, 2004), and whether respondents hold a teaching credential and teach in the area they are credentialed in (Garet et al., 2001; Morrow & Casey).

There are also certain demographic questions that relate more directly to the schools. The demographic question most often reported is on the geographic location of the school, whether it is in a rural, urban, or suburban area (Allen, 2006; Brinkerhoff, 2006; Hughes et al., 2005; Keer & Verhaeghe, 2005; Keller et al., 2005; Supovitz & Turner, 2000; Truscott & Truscott, 2004; Weiss et al., 2003).

Another school demographic of interest deals with the SES of the area the school serves. This is usually done by reporting the number or percentage of students eligible or receiving free or reduced lunches (Allen, 2006; Garet et al., 2001; Hughes et al., 2005; Keer & Verhaeghe, 2005; Mistretta, 2005; Shulman & Armitage, 2005; Supovitz & Turner, 2000; Truscott & Truscott, 2004; Weiss et al., 2003). Additionally, some studies report the percentage of students in differing ethnic categories (Mistretta; Shulman & Armitage; Weiss et al.). Other studies reported the school size (Hughes et al.; Supovitz & Turner; Weiss et al.) and class size (Keer & Verhaeghe; Kimble et al., 2006; Truscott & Truscott). One final demographic item that some studies report is the school achievement level as measured by Annual Yearly Progress (AYP; Allen; Truscott & Truscott).

## Conclusion

The literature on teacher professional development is rich with ideas on what characteristics are essential for an effective professional development. Most researchers

agree that the key characteristics of effective professional development are: (a) focusing on content and/or pedagogy; (b) providing information that can be implemented into the teachers existing curriculum; (c) providing participants opportunities for active learning; (d) providing collaboration among participants from the same schools, grades, or subjects teaching; and (e) providing a professional development experience that is extended in duration (Guskey, 2003a; Jeanpierre et al., 2005; Snow-Renner & Lauer, 2005).

Additionally, the review of the literature suggests that teacher professional development should be evaluated on five different levels (Guskey, 2000, 2002). Yet, there are few studies that evaluate professional development at the higher two levels of participants' use of materials and student achievement. In measuring the impact of a professional development, it is important to determine the extent to which participants have used the materials, ideas, or activities following the professional development activity. This evaluation should include questions to determine the extent to which participants continue to use materials from the *FLP* curriculum and the demographic variables that make up continued users of *FLP* curriculum.

# CHAPTER III

# PROCEDURES

## Purpose

The purpose of this study was to evaluate the effectiveness of *FLP* teacher professional development program as measured by participants' continued use of materials. *FLP* is an asynchronous online professional development program structured by the five key characteristics of effective professional developments as identified in the review of literature. *FLP* is an online graduate course offered to elementary teachers throughout the state of Utah and has been providing professional development since 2003 and thus served as a model for evaluation.

## Population and Sample

The participants from this study came from a census group. The census group consisted of 300 elementary teachers from across the State of Utah. These teacher/ participants represented 21 of the 40 school districts in the state. All of the participants were selected because of their enrollment in Utah State University's *FLP* (ASTE 6400) online course between 2003 and 2006. Each participant freely chose and paid to attend the course and did not receive any sort of stipend or monetary reward from the facilitators of the professional development program.

Obtaining the list of participants who had taken *FLP* proved to be difficult. Initially, the researcher approached the Director of Agriculture in the Classroom who

created the *FLP* course and obtained a list of all the people who had taken *FLP*. After careful review of the list of participants it was noticed that the list was missing all of the participants who had taken the course the first year it was offered. Next, the course designer requested a list of all class members from the registrar at Utah State University. This list was inadequate and much smaller in number than the original list obtained from the course designer. Finally, the Agriculture in the Classroom director met with the *FLP* instructors and was able to produce a complete list of participants. This list contained the names, email addresses, and the schools taught at of 300 people who had taken *FLP* between 2003 and 2006.

The next step was verifying email addresses of each participant. The researcher phoned each of the schools where the participants worked while taking *FLP* to verify email addresses. Email addresses were verified by phone for 169 participants. In addition to phoning schools to verify email addresses, Google searches were conducted to locate the remaining 131 participants. Three additional participants' emails were located and verified through the internet.

Of the 300 potential participants, 172 were sent electronic surveys. The researcher was able to verify addresses for 172 participants out of the 300 by contacting each school where the participant had been an employee during the time they took *FLP* to verify and/or locate addresses for those individuals. In addition to calling each school where the participants were employed, the researcher did a Google search of each participant with a nonverified address as a means to locate participants who were no longer working at the same school as they had during *FLP* course.

## Research Design

This study used a casual-comparative research design, which is otherwise known as an ex post facto design. This design discovered the possible causes and effects of a behavior pattern or personal characteristics by comparing individuals displaying the particular behavior pattern with individuals who do not display the behavior pattern (Borg & Gall, 1989). The causal-comparative method is regularly used in education studies when experimentation is not possible. It identifies a cause for a particular behavior after some treatment has been administered, as is the case for this study.

## Data and Instrumentation

The researcher developed survey instrument was used to identify which teacher participants have continued to implement the *FLP* curriculum and which demographic variables contributed to their continued use. The survey instrument was emailed to each participant of the *FLP* program.

Each potential participant received five different personalized email messages asking them to complete an online survey about their use of *FLP* materials. These emails were sent using a free program found online called SendBlaster. SendBlaster was very useful in sending a large number of email messages at one time. In addition to sending a large number of emails at one time, it was able to personalize each message. Every email message sent was addressed personally to each individual, did not contain the email addresses of all the other people receiving the email message, and provided the participant with their own unique username and password allowing them to login to the

survey. The email messages also provided an internet link directly to the electronic survey.

The survey instrument was created electronically and housed on a computer server at Utah State University. Each participant was assigned a unique username and password that allowed them to login to the survey. When a participant logged in to the survey they were taken to an informational page notifying them of their rights and the risks associated with taking the survey. In order to continue with the survey, the participant had to indicate they had read and understood the inherent risks by checking the appropriate box. The next page of the survey asked the participant to answer demographic questions. The survey was programmed so that each time the participant marked an item on the survey, the response was recorded in a database. Some of the questions asked on the demographic page were: Which grades do you teach and what school year did you take *Food, Land, and People*? The participants' answers to these questions determined the survey questions they were asked after the demographic section. Next the participants were taken to a section of the survey that asked for them to indicate all of the lesson plans or activities they have used since taking *FLP*. The survey had one column of lessons and activities for participants who had taken *FLP* one year ago, two columns for those who took it two years ago, and three columns for those who took *FLP* three years ago. Additionally, each participant's survey asked them which lesson plans and activities they had used for each grade level they taught. Participants who indicated they taught pre-kindergarten only had lesson plans and activities that were available to that grade. Likewise, first grade teacher were asked which lesson plans and activities

they had used with their first-grade class, second grade for second grade, third for third on through sixth grade. Participants that indicated they taught multiple grades were asked which lesson plans and activities they had used with each corresponding grades. The paper version of the complete survey can be seen in Appendix C. This study did not specifically analyze which lesson plans and activities were used most often, but that information can be found in Appendix D.

The survey was administered via email and the internet. Each targeted participant was sent a personalized email using a free computer program called SendBlaster. This program allowed form letters to have personalized items formatted for individual participants such as their name, user name, and password. SendBlaster sent a personalized email message up to 100 different people at one time without showing the email addresses of all 100 people. When the participants received the email message, the letter was addressed to them by name and the only email address displayed was their own. This personalizing of the email message was intended to make the participants believe that they were the only one receiving the email message and thus be more likely to respond (Dillman, 2007). The initial email message explained that they would soon be receiving another email with a link to take an online survey. In addition to having the email explain to the participant that they would soon be receiving another email from the researcher, the emailed letter (see Appendix E) explained the purpose of the survey, why they were chosen to participate, the secure nature of the survey, and the possibility of receiving free books as an incentive for participating.

Two days after the initial or preletter was sent the participants were each sent

another email (see Appendix F). This message contained instructions for the participants to access the survey and their required usernames and passwords. Additionally, the message again explained the importance of the survey, the possibility of being rewarded for taking the survey, and an internet link to the survey.

A third email (see Appendix G) was sent 2 weeks later to all participants who had still not taken the survey. This message was very similar to the prior message including instructions for logging onto the survey, their required username and password, and a request to complete the survey.

A fourth email (see Appendix H) was sent 6 days later to participants who had still not completed the survey and then a fifth email (see Appendix I) 6 days later. Both of these email messages were very similar as the previous email messages. Each one reemphasized the importance of the survey and made a personal request on behalf of the researcher for participants to take the survey so that the researcher could finish the research.

Evidence of face and content validity was acquired by a panel of five experts consisting of university teacher educators in elementary science education and agricultural education who have had experience working with professional development programs. They analyzed the survey questions for validity and appropriateness. Internal consistency for the scale items was measured using a split half of the instrument (Borg & Gall, 1989).

A post-hoc reliability analysis of the survey instrument was performed to determine if the instrument had an acceptable measure of reliability. One limitation of

the instrument was that it contained no variables appropriate for a cronbach's coefficient alpha. After consulting with a panel of experts concerning the instrumentation, it was determined to calculate an internal consistency measure of reliability. Borg and Gall (1989) stated, "internal consistency can be determined from a single administration of a single form of the test" (p. 260).

A sustained implementation scale (SIS) was used to classify the amount of continued use of *FLP* curriculum a participant has reported. This measurement was created by determining the number of lessons and activities a participant used each year and then weight the scores (Linn & Haug, 2002). The reported number of lessons or activities used in the third year following the professional development program was weighted at three times the reported number of lessons or activities used. Continued use 3 years after the professional development program signifies a stronger indication of impact than someone who uses lessons immediately following the professional development. The number of lessons or activities used in the second year following the professional development was weighted at two times the reported number used. The number of lessons and activities used in the first year following the professional development was weighted by one times the number reported. A total SIS was determined for each participant by summing each of the weighted scores across Years 1, 2, and 3. Tables 8- 10 indicate how the SIS was calculated.

Table 8

*Sample Sustained Implementation Scale Table for Participants Who Completed Food, Land, and People 1 Year Ago*

| ID# | Year 1 after PD # of lessons x 1 | SIS score |
|---|---|---|
| 1 | 5 x 1 | 5 |
| 2 | 4 x 1 | 4 |
| 3 | 0 x 1 | 0 |

Table 9

*Sample Sustained Implementation Scale Table for Participants Who Completed Food, Land, and People 2 Years Ago*

| ID# | Year 1 after PD # of lessons x 1 | Year 2 after PD # of lessons x 2 | SIS score |
|---|---|---|---|
| 4 | 5 x 1 | 3 x 2 | 11 |
| 5 | 4 x 1 | 4 x 2 | 12 |
| 6 | 0 x 1 | 0 x 2 | 5 |

Table 10

*Sample Sustained Implementation Scale Table for Participants Who Completed Food, Land, and People 3 Years Ago*

| ID# | Year 1 after PD # of lessons x 1 | Year 2 after PD # of lessons x 2 | Year 3 after PD # of lessons x 3 | SIS score |
|---|---|---|---|---|
| 4 | 5 x 1 | 4 x 2 | 3 x 3 | 12 |
| 5 | 4 x 1 | 4 x 2 | 0 x 3 | 12 |
| 6 | 8 x 1 | 0 x 2 | 0 x 3 | 8 |

## Data Analysis

Analysis of the study is separated into three sections as designated by the major research questions.

1. With what frequency do participants continue to use the *Food, Land, and People* curriculum?
2. What is the relationship between the Sustained Implementation Scale (SIS) and participant characteristics?
3. What variables explain the variance in SIS?

The following questions are related to the first three questions but add clarity as to the specific demographic variables.

1. How does gender relate to the SIS of participants?
2. How does the number of years teaching influence the SIS of participants?
3. How does the subject or grade level teaching influence the SIS of participants?
4. How does the highest degree obtained by the participant influence the SIS of participants?
5. How does teaching with a teaching credential influence the SIS of participants?
6. How does the location of the school (rural, urban) influence the SIS of participants?
7. How does the SES of the students influence the SIS of participants?
8. How does the percentage of ethnic students at the school influence the SIS of

participants?

9. How does whether the school has met Annual Yearly Progress (AYP) influence the SIS of participants?

Question 1 was explained by descriptive statistics. It identified participants by the level of continuous use of *FLP* curriculum as determined by the SIS model. Results were reported as means and standard deviations.

The second question and the follow-up specific questions were tested with a multiple linear regression, a statistical technique for exploring the strength of relationship between several independent variables and one dependent variable (Borg & Gall, 1989; Box & Jenkins, 1990; Hair, Anderson, Tatham, & Black, 1992; Pedhazur, 1982; Tarpley, 1993). The independent variables for this study were: (a) gender, (b) number of years teaching, (c) grade-level teaching, (d) highest degree obtained, (e) type of teaching certificate held, (f) location of school (rural, urban), (g) SES, (h) percentage of non-white students at the school, and (i) whether school meets AYP. The dependent variable was the total SIS score. Multiple linear regression is appropriate for data which is nominal, ordinal, interval, or ratio (Hair et al.). The .05 level of significance was set a priori (Desimone et al., 2002; Knobloch & Whittington, 2002; Parke & Coble, 1997).

The third question, which variables explain the variance in SIS scores, was answered by the multiple linear regressions. Three multiple linear regressions were conducted using three separate dependent variables. Each regression was used to analyze demographic items and their influence on participant implementation and/or continued use of *FLP* curriculum.

The individual dependent variables were total SIS scores from (a) participants who completed the *FLP* program 1 year ago; (b) participants who completed the *FLP* program 2 years ago; and (c) participants who completed the *FLP* program 3 years ago. Participants who completed the professional development program one year ago were analyzed and compared on the amount of implementation of *FLP* curriculum following their first year after their professional development experience. Participants who completed the *FLP* program 2 years ago were analyzed on the level of implementation the first year after the professional development experience and their level of continued use of materials the second year after the professional development experience. The third regression was conducted using participants who completed the *FLP* program 3 years ago. These participants' SIS scores were analyzed and compared to other third-year participants on the level of implementation the first year after the professional development program and the levels of continued use the second and third years after the professional development program.

The appropriate analysis of data was an integral component of this research study. The selected data analysis processes were useful in providing information that was used to describe and make interpretations of the data collected. All statistical analysis was conducted using SPSS, statistical software available on computers at Utah State University.

# CHAPTER IV

# RESULTS

This research utilized several dependent measures, including SIS scores and multiple linear regressions for three separate groups of participants. This chapter will discuss survey return rates, describe selected personal and professional characteristics of participants, provide descriptive statistics related to SIS scores of implementation and continued use of *FLP* lessons and activities within each participant group, and discuss the relationship of the selected personal and professional characteristics to SIS scores within each participant group. The following research questions are answered in this section:

1. With what frequency do participants continue to use the *Food, Land, and People* curriculum?

*2.* What is the relationship between the Sustained Implementation Scale (SIS) and participant characteristics?

*3.* What variables explain the variance in Sustained Implementation Scale (SIS)?

## Survey Return Rates

The review of literature indicated that acceptable response rates for online surveys ranged between 20-50% (Dillman, 2007). The original target population size was 300, but the researcher was able to validate email address for 172 *FLP* participants. Of the 172 targeted participants, 65 participants completed and returned the survey for an overall return rate of 37.8%. Of the 65 participants, data analysis of responses occurred in three groups. Group 1 included participants who took *FLP* during the 2005-06 academic year,

Group 2 included participants who took *FLP* during the 2004-05 academic year; and Group 3 was comprised of participants who took *FLP* during the 2003-04 academic year. There were initially 62 people targeted to take the survey in Group 1, of whom 23 participants (37.1%) completed the survey. Group 2 initially had 75 people targeted to take the survey with 24 participants (32.0%) completing the survey. In Group 3, 35 people were targeted to take the survey and 18 participants (51.4%) completed it.

The first time the email was sent out to prospective participants requesting them to take the survey, 35 people responded. These respondents account for 53.8% of the total responses. This first request for participants to take the survey yielded the highest return rate. The second time an email was sent requesting people to take the survey, 19 responded. This number accounts for 29.2% of the total responders. The third email brought six responses. This number represents 9.2% of the total responders. The fourth email resulted in five additional participant responses. This last group of responders represents 7.8% of the total responses.

Every emailed survey solicitation resulted in more surveys being completed; however there was a decline in the number of responses each time. The researcher did not continue to send emails after the fourth request as a courtesy to *FLP* participants. It was felt that after four survey solicitations the requests were becoming an annoyance. Acceptable survey return rates are between 20-50% (Dillman, 2007). This study was within the acceptable limits with an overall return rate of 37.8%.

## Participant Demographics

This study collected participant data on nine selected personal and professional characteristics. These characteristics were: the participant's gender, the number of years teaching experience, the highest degree earned, the type of teaching license held, the grade level primarily taught, the location of the school (rural or urban), the percentage of low SES students at the school, the percentage of non-white students at the school, and whether the school met NCLB requirements of Annual Yearly Progress (AYP) the year the teacher enrolled in *FLP*.

The majority of the participants in this study were female (> 90%). For a breakdown of participant gender by groups see Table 11. The second demographic variable this study analyzed was the number of years teaching experience. On average most teachers had 14 or more years of teaching experience. Table 12 shows the average number of teaching years by groups. The highest degree earned by the participants was another demographic variable analyzed. The majority of the participants (63.1%) had earned a Bachelor's degree. Table 13 gives a detailed breakdown of the degrees earned by participants of each group.

Table 11

*Gender of Food, Land, and People Participants*

| | Female | | Male | |
|---|---|---|---|---|
| Group | *n* | % | *n* | % |
| 1 | 17 | 94.4 | 1 | 5.6 |
| 2 | 22 | 91.7 | 2 | 8.3 |
| 3 | 22 | 95.7 | 1 | 4.3 |
| Total of groups | 61 | 93.8 | 4 | 6.2 |

Table 12

*Average Number Years Teaching of Food, Land, and People Participants*

| Group | *M* | *SD* |
|---|---|---|
| 1 | 14.28 | 7.74 |
| 2 | 19.63 | 8.77 |
| 3 | 14.09 | 7.03 |
| Total of groups | 16.18 | 8.22 |

Table 13

*Highest Degree Earned by Food, Land, and People Participants*

| | Bachelors | | Masters | |
|---|---|---|---|---|
| Group | *n* | % | *n* | % |
| 1 | 13 | 72.2 | 5 | 27.8 |
| 2 | 15 | 62.5 | 9 | 37.5 |
| 3 | 13 | 56.5 | 10 | 43.5 |
| Total of groups | 41 | 63.1 | 24 | 36.9 |

The type of teaching certificate was another demographic variable collected in this study. Participants either had a Utah Level 1 teaching certificate, which is the beginning teaching certificate valid for up to three years, a Utah Level 2 teaching certificate which is earned after teaching for at least three years, a Utah Level 3 teaching certificate which is achieved with more than three years of teaching experience and either having earned a Doctorate degree or being National Board Certified. Additionally, there were some teachers who held a certificate from another state or did not have a teaching certificate. Table 14 shows the type of teaching certificate held in each group.

Table 14

*Teaching Certificate Held by Food, Land, and People Participants*

| | Group 1 | | Group 2 | | Group 3 | |
|---|---|---|---|---|---|---|
| Teaching certificate | Responses | % | Responses | % | Responses | % |
| Utah type I | 4 | 22.2 | 7 | 29.2 | 7 | 30.4 |
| Utah type II | 14 | 77.8 | 5 | 20.8 | 13 | 56.5 |
| Utah type III | -- | -- | 8 | 33.3 | 2 | 8.7 |
| Other | -- | -- | 3 | 12.5 | 1 | 4.3 |
| None | -- | -- | 1 | 4.2 | -- | -- |

Data were collected on which grades each respondent was teaching as shown in Table 15. Data is reported by pre-kindergarten or kindergarten, first grade, second grade, third grade, fourth grade, fifth grade, sixth grade, or multiple grades.

Demographic information relating to the size of community where the participant was teaching was collected in this study. Participants were classified as either teaching in rural or urban areas. For this study, a rural area has a population of less than 50, 000 residents. An urban area in this study is classified by having more than 50, 000 people. The majority of the participants in this study taught in rural areas. Table 16 shows the size of the community where participants from each group are teaching.

The percentage of low SES students at the schools where the participants teach was another demographic variable analyzed. The percent of low SES students was determined by the number of students eligible for free or reduced lunches. On average, most participants had more than 26% of their students eligible for free or reduced lunch. Table 17 shows the averages for each group.

Table 15

*Grades Being Taught by Food, Land, and People Participants*

| | Group 1 | | Group 2 | | Group 3 | | Total groups | |
|---|---|---|---|---|---|---|---|---|
| Grade | No. | % | No. | % | No. | % | No. | % |
| PreK-K | 2 | 11.1 | 1 | 4.2 | 1 | 4.3 | 4 | 6.2 |
| First | 2 | 11.1 | 5 | 20.8 | 2 | 8.7 | 9 | 13.8 |
| Second | 0 | 0.0 | 2 | 8.3 | 2 | 8.7 | 4 | 6.2 |
| Third | 1 | 4.2 | 4 | 16.7 | 1 | 4.3 | 6 | 9.2 |
| Fourth | 4 | 22.2 | 3 | 12.5 | 3 | 13.0 | 10 | 15.4 |
| Fifth | 4 | 22.2 | 1 | 4.2 | 6 | 26.1 | 11 | 16.9 |
| Sixth | 0 | 0.0 | 3 | 12.5 | 5 | 21.7 | 8 | 12.3 |
| Multiple | 5 | 27.8 | 5 | 20.8 | 3 | 13.0 | 13 | 20.0 |

Table 16

*Size of Community Where Food, Land, and People Participants Teach*

| | Rural (< 50,000 residents) | | Urban (> 50,000 residents | |
|---|---|---|---|---|
| Group | *n* | % | *n* | % |
| 1 | 11 | 61.1 | 7 | 38.9 |
| 2 | 22 | 91.7 | 2 | 8.3 |
| 3 | 13 | 56.5 | 10 | 43.5 |
| Total of groups | 46 | 70.8 | 19 | 29.2 |

Table 17

*Percentage of Students Eligible for Free or Reduced Lunch*

| Group | *M* | *SD* |
|---|---|---|
| 1 | 26.33 | 17.80 |
| 2 | 31.63 | 23.30 |
| 3 | 31.00 | 21.36 |
| Total of groups | 29.94 | 21.00 |

Another demographic variable collected was the percentage of non-white students at the school where the participants teach. The participants' schools averaged between 13% and 19%. Table 18 shows the percentage of non-white students within each group.

A final demographic variable collected was whether the school of the participant had met AYP under NCLB legislation the year they enrolled in *FLP*. A few participants taught at private schools that were not required to report AYP. Table 19 reports these by the number of participants and percents for each group.

Table 18

*Percentage of Non-White Students*

| Group | *M* | *SD* |
|---|---|---|
| 1 | 13.33 | 12.74 |
| 2 | 17.67 | 22.86 |
| 3 | 18.35 | 18.44 |
| Total of groups | 16.71 | 18.77 |

Table 19

*Number of Schools Meeting Adequate Yearly Progress*

| | Yes | | No | | Not reported | |
|---|---|---|---|---|---|---|
| Group | No. | % | No. | % | No. | % |
| 1 | 15 | 83.3 | 0 | 0.0 | 3 | 16.7 |
| 2 | 19 | 79.2 | 4 | 16.7 | 1 | 4.1 |
| 3 | 21 | 91.4 | 1 | 4.3 | 1 | 4.3 |
| Total of groups | 55 | 84.6 | 5 | 7.7 | 5 | 7.7 |

What Is the Frequency That Participants Continue to Use FLP Curriculum?

The participants in Group 1 took the *FLP* professional development program 1 year before this study occurred; thus, there is only 1 year of data to analyze and calculate SIS scores (Table 20). Group 2 took the *FLP* professional development program 2 years prior to data collection; thus, there are 2 years of SIS scores. Group 3 took the *FLP* professional development program 2 years before the study and has 3 years of SIS scores.

A post-hoc reliability analysis of the survey instrument was performed to determine if the instrument had an acceptable measure of reliability. One limitation of the instrument was that it contained no variables appropriate for a Cronbach's Coefficient Alpha. After consulting with a panel of experts concerning the instrumentation, it was determined to calculate an internal consistency measure of reliability. Borg and Gall (1989) stated that "internal consistency can be determined from a single administration of a single form of the test" (p. 260). After conducting a split half of the instrument, scaled variables were summed and compared. The resulting comparison indicated no significant difference between the halves, $t(54) = -1.528$, $p = .132$.

Table 20

*Average Sustained Implementation Scale Scores from Groups 1, 2, and 3*

| | Year 1 | | Year 2 | | Year 3 | | Total | |
|---|---|---|---|---|---|---|---|---|
| Group | *M* | *SD* | *M* | *SD* | *M* | *SD* | *M* | *SD* |
| 1 | 12.78 | 12.96 | + | + | + | + | 12.78 | 12.96 |
| 2 | 11.92 | 11.72 | 20.83 | 19.80 | + | + | 32.75 | 31.31 |
| 3 | 17.30 | 13.14 | 20.00 | 17.36 | 25.57 | 23.01 | 62.87 | 41.80 |

*Note.* + indicates years when participants were not teaching.

## Relationship Between the SIS and Participant Characteristics and the Variables Explaining the Variance in SIS

A multiple linear regression was performed on the responses from the participants who took FLP during the 2005-06 academic school year (Group 1). In the regression model, the total SIS was used as the dependent variable with the other selected demographic variables chosen as the independent variables (Table 21). Overall, the regression model indicated no statistically significant relationship among the combined selected demographic variables and total SIS, $F(8, 6) = 3.368$, $p = .078$. However, the $R = .904$. Therefore, 81.8% of the variance in SIS was explained by the eight demographic variables. For this analysis, the researcher entered nine variables into the model. However, no variance was measured in "AYP" and the variable was deleted by the statistical program.

Table 21

*Multiple Linear Regression for Group 1 Participants*

| Variable | Beta | *t* | *p* |
|---|---|---|---|
| Gender | .308 | 1.371 | .116 |
| Years teaching | .895 | 3.876 | .008* |
| Highest degree | -.667 | -2.418 | .052 |
| Type of license | .550 | 2.691 | .036* |
| Grade level | .457 | 1.769 | .127 |
| School location | -.171 | -.622 | .557 |
| SES | .376 | 1.272 | .251 |
| Percent ethnic | -.661 | -2.392 | .054 |
| AYP | + | + | + |

* Indicates significance at the .05 level.

+ Indicates that the model deleted the variable from the analysis due to missing correlations.

In the regression analysis, two variables indicated a statistical significance in the model. There was a statistically significant relationship between total SIS and "Years Teaching," $p = .008$ as well as between total SIS and "Type of License," $p = .036$. Further analysis indicated that as a teacher had more years of teaching experience and a higher level of teaching license, the total SIS tended to be higher. Years teaching and the type of teaching license are both factors that influence whether participants continued to use the *FLP* materials.

A multiple linear regression was performed on the responses from the participants who took FLP during the 2004-05 academic school year (Group 2). In the regression model, the total SIS was used as the dependent variable with the other selected demographic variables chosen as the independent variables (Table 22). Overall, the regression model indicated no statistically significant relationship among the combined selected demographic variables and total SIS, $F(9, 13) = .535$, $p = .825$. However, the $R = .520$. Therefore, 27.0 % of the variance in SIS was explained by the nine demographic variables. For this analysis, the researcher entered nine variables into the model.

A multiple linear regression was performed on the responses from the participants who took FLP during the 2003-04 academic school year (Group 3). In the regression model, the total SIS was used as the dependent variable with the other selected demographic variables chosen as the independent variables (Table 23). Overall, the regression model indicated no statistically significant relationship among the combined selected demographic variables and total SIS, $F(9, 12) = 1.618$, $p = .215$. However, the

Table 22

*Multiple Linear Regression for Group 2 Participants*

| Variable | Beta | *t* | *p* |
|---|---|---|---|
| Gender | .134 | .400 | .695 |
| Years teaching | -.251 | -.719 | .485 |
| Highest degree | -.104 | -.358 | .726 |
| Type of license | .074 | .204 | .842 |
| Grade level | .304 | .966 | .352 |
| School location | -.083 | -.174 | .865 |
| SES | .037 | .081 | .936 |
| Percent ethnic | -.276 | -.503 | .624 |
| AYP | .459 | 1.322 | .209 |

Table 23

*Multiple Linear Regression for Group 3 Participants*

| Variable | Beta | *t* | *p* |
|---|---|---|---|
| Gender | -.127 | -.534 | .603 |
| Years teaching | .578 | 2.619 | .022* |
| Highest degree | .088 | .367 | .720 |
| Type of license | .087 | .372 | .717 |
| Grade level | .230 | .937 | .367 |
| School location | .273 | .962 | .355 |
| SES | -.699 | -1.381 | .193 |
| Percent ethnic | 1.007 | 1.881 | .084 |
| AYP | .305 | 1.362 | .198 |

* Indicates significance at the .05 level.

$R$ = .740. Therefore, 54.8% of the variance in SIS was explained by the nine demographic variables. For this analysis, the researcher entered nine variables into the model.

In the regression analysis, one variable indicated a statistical significance in the model. There was a statistically significant relationship between total SIS and "Years

Teaching," $p = .022$. Further analysis indicated that as a teacher had more years of teaching experience, the total SIS tended to be higher. The number of years teaching experience was a significant factor influencing Groups 1 and 3 on their continued use of *FLP* materials after the professional development program.

# CHAPTER V

# DISCUSSION

This qualitative research study evaluated the effectiveness of the *FLP* professional development program as measured by the frequency that participants continued to use lesson plans and activities taught during the program. Effectiveness of the professional development experience was determined by calculating a SIS score for each responding participant from the SIS evaluation model.

A review of the literature indicated that many researchers agreed on five common characteristics of effective professional development programs (Guskey, 2000). Despite concurrence on key characteristics, little research has been conducted on how effectiveness is measured. This aim of this study was to determine whether a professional development program that was structured by key characteristics and provided online was effective in promoting continued implementation and use of lesson plans and activities provided during the professional development experience.

This chapter discusses the findings of this research and presents the broader implications of this study. The discussion is organized around the following sections: survey, SIS scores, selected personal and professional characteristics, online professional development, conclusions, and future research ideas.

## Survey Return Rates and Population Size

One complication this study experienced was having a low sample size in its three groups. Initially the study was going to analyze all participant responses as an aggregate,

but later in the design process it was decided that the study would be more significant if participants were separated by the year they took the *FLP* course. Separating participants by year reduced the population sizes from 300 total participants to 100 participants in each group. An additional sample size problem the study experienced was that the researcher was only able to verify email addresses for 172 of the 300 *FLP* participants. Of the 172 participant's verified email addresses, 62 were in Group 1, 75 were in Group 2, and 35 were in Group 3. Although the study had acceptable survey return rates (Group 1 = 37.1%, Group 2 = 32.0%, Group 3 = 51.4%), the resulting number of participants in each group that completed the survey was relatively low, Group 1 ($N$ = 23), Group 2 ($N$ = 24, Group 3 ($N$ = 18) resulting in low power for the statistical analysis.

## Survey

The first time the email was sent out to prospective participants requesting them to take the survey, 35 people responded. These respondents account for 53.8% of the total responses. This first request for participants to take the survey yielded the highest return rate. The second time an email was sent requesting people to take the survey, 19 responded. This number accounts for 29.2% of the total responders. The third email brought six responses. This number represents 9.2% of the total responders. The fourth email resulted in five additional participant responses. This last group of responders represents 7.8% of the total responses.

Every emailed survey solicitation resulted in more surveys being completed;

however there was a decline in the number of responses each time. The researcher did not continue to send emails after the fourth request as a courtesy to *FLP* participants. It was felt that after four survey solicitations the requests were becoming an annoyance. Acceptable survey return rates are between 20-50% (Dillman, 2007). This study was within the acceptable limits with an overall return rate of 37.8%.

Response rates for electronic surveys are traditionally slightly lower than paper-based surveys (Kaplowitz et al., 2004). Acceptable response rates for electronic surveys is between 20-50% (Dillman, 2007; Heerwegh et al., 2005; Kaplowitz et al.; Manfreda et al., 2005; National Research Council, 2003; Schonlau et al., 2002; Simsek & Veiga, 2000). Despite electronic response rates being lower, researchers can employ specific actions and techniques to increase response rates. Personalizing email is one way to increase electronic response rates. Sending e-mail to each participant separately, not using CC or putting every participant in the address bar, and personalizing cover letters has increased response rates by as much as 8.6% (Heerwegh et al.).

This study used the suggestions of Heerwegh and colleagues (2005) and incorporated personalized methods. Every email message sent to participants was personally addressed to the individual participant by name. Additionally, each email message received by participants only showed that participant's email address.

A complication of using email as the primary source for distributing surveys that was not anticipated at the beginning of this study was the issue that email servers sometimes block emails as unsolicited emails (SPAM). School districts try very hard to protect their employees from being inundated with SPAM and thus many have very

stringent blocking mechanisms. Several participants emailed the researcher that they were checking their email junk-boxes and discovered the letter asking them to take the survey which illuminated this unanticipated problem. While these participants found that the emails had been removed by the server, it is hard to say how many potential participants never received the email asking them to take the survey. Once the problem was identified, the researcher tried various approaches to ensure that the emails would be delivered to all participants, such as using a variety of subject headers in the email, leaving the subject line blank, and sending the emails from different email accounts. This is a limitation in using electronic surveys delivered via email, and while the return rate was within the acceptable range, it is possible that some of the non-responders never received the message. This issue is certainly one to consider when doing online surveys in the future. SPAM filters remain to be an unresolved problem in online survey research that needs to be addressed for future studies

## SIS Scores

Professional development programs that do not result in some form of participant change cannot be considered effective (Showers et al., 1987). This premise was a foundational issue in this study. Did teachers use the lessons and activities in their classrooms? Participants in each group of this study were asked to report which *FLP* lessons and activities they had used each year since taking the *FLP* program as an indication of participant change. The participant's yearly total number of lessons and activities used were put into an SIS evaluation model described in the previous chapters.

This model uses a system of weighting scores to provide a systematic means of comparing participants. The combined number of lessons and activities used during the first year after the professional development experience is weighted one time. The combined number of lessons and activities used during the second year after the professional development experience is weighted by two. The combined number of lessons and activities used during the third year after the professional development experience is weighted by three. Finally, a total SIS was calculated by summing each SIS score for each participant. Participants who have only used a few *FLP* materials following the professional development experience will not receive as high of a SIS score as a participant who has continuously used *FLP* materials for several years. A high SIS score is obtained by continuously using *FLP* each year after the professional development program. The rationale for weighting the scores in Years 2 and 3 is that teachers who continue to use materials two and three years after the program have demonstrated that the professional development program has had a great impact on them. If this were not so, the teachers would discontinue using the materials.

Participants in Group 1 took *FLP* professional development during the 2005-06 academic year and only have one SIS score. Participants in Group 2 took the *FLP* program during the 2004-05 school year and have two SIS scores plus a total SIS. Participants in Group 3 took the *FLP* program during the 2003-04 school year and have three SIS scores plus a total SIS score. It is expected that participants with only one SIS score will have a considerably lower total SIS than participants with two or three SIS scores because of the lower weighting on the lesson plans and activities used and because

they do not have the advantage of summing multiple SIS scores.

Participants were required to utilize several *FLP* lessons and activities during the professional development program, but after the program was completed, there were no external forces requiring participants to use the *FLP* lessons and activities. The first year following the professional development program is considered the implementation year. Groups 1 and 2 had very close SIS scores as is seen in Table 24. Although Group 3's SIS appears slightly higher than the other two groups, because of the standard deviations ranging from 11.72 to 13.14 points the scores are actually quite similar. Year 1 SIS scores indicate the average number of lesson plans and activities used by participants the first year after taking *FLP*.

The second year after the professional development program is the beginning of a continued use stage as defined by the SIS model. Participants who continue to use materials the second year after the professional development experience receive a SIS that is weighted two times greater than SIS in Year 1. As shown in Table 24, the Year 2 SIS is very similar for each Group. The Year 2 SIS is almost two times greater than Year 1 scores. While Year 2 participant numbers are larger than Year 1's participants, it does

Table 24

*Sustained Implementation Scales*

| | Group 1 | | Group 2 | | Group 3 | |
|---|---|---|---|---|---|---|
| Year | *M* | *SD* | *M* | *SD* | *M* | *SD* |
| 1 | 12.78 | 12.96 | 11.92 | 11.72 | 17.30 | 13.14 |
| 2 | | | 20.83 | 19.80 | 20.00 | 17.36 |
| 3 | | | | | 25.57 | 23.01 |
| Total | 12.78 | 12.96 | 32.75 | 31.31 | 62.87 | 41.80 |

not mean the participants have used more lesson plans and activities the second year. In actuality the average number of materials used has slightly decreased. While Group 2 had reported using almost 12 lessons or activities in Year 1, in Year 2 they reported using only 10 lessons and activities. While Group 3 had reported using nearly 18 lessons and activities during Year 1, they also reported only using only 10 lessons or activities during Year 2. The reason the SIS scores are larger in Year 2 is because for every lesson plan or activity reportedly used, the number is multiplied by two. It is felt that use of materials two years after a professional development experience is a strong indication of the impact the professional development program had on the participants' teaching and is thus weighted two times greater than the amount of use the first year after the program.

The use of materials the third year following the professional development experience indicates a strong continued use correlation. Group 3 was the only group with a Year 3 SIS score because they are the only ones that took *FLP* 3 years ago. As seen in Table 24, the average SIS scores in Year 3 increased by 5 points. This really is not a significant increase in score. What it actually means is that on average participants were only using eight lesson plans or activities the third year after the professional development experience. Year 3 SIS scores were created by multiplying the number of reported lesson plans or activities being used by three. Participants who are still using materials from the professional development activity three years after the program have indicated that the professional development program has had a significant impact on their teaching and thus it receives a weighting of 3.

This study only collected data on the number of lesson plans and activities each

teacher used the years following the professional development program. In an additional study it could be beneficial to determine which lesson plans and activities are being used.

Table 24 also shows the total SIS scores for each group. Group 3 had the highest total SIS, Group 2 had the second highest, and Group 3 the lowest. This is to be expected because total SIS scores are calculated by summing Year 1 SIS, Year 2 SIS, and Year 3 SIS scores. Groups 1 and 2 do not have as many SIS scores to put into the equation as Group 3 does. Likewise Group 1 does not have as many SIS scores as Group 2. We cannot compare total SIS scores across groups. Group 1 scores can only be compared within Group 1, Group 2 scores can only be compared within Group 2, and Group 3 can only be compared within Group 3.

SIS scores reveal a declining trend in the amount of lesson plans and activities used each subsequent year following the *FLP* experience. Although the number of *FLP* lessons and materials participants use has slightly decreased, the average SIS scores have increased. These results offer validity to the research on effective professional development programs by confirming that effective professional development programs result in changes in teacher attitudes or practice (Boyle et al., 2005, 2004). The rate that participants have discontinued use was much smaller than the weighting of the scores in subsequent years. This is an indicator that the *FLP* professional development was effective in promoting participant continued use.

The research on teacher change has historically suggested that teachers are resistant to change (Cuban, 1988; Fullman, 1991). Yet more recent research (Richardson, 2001) has indicated that teachers will make changes in their teaching practices when they

are involved in professional development activities structured by the five key characteristics of effective professional development. The five key characteristics of effective professional development are: (a) A focus on teaching specific content (Loucks-Horsley et al., 2003); (b) The integration of specific teaching practices or pedagogy into the professional development (Foulger, 2005); (c) The engagement of participants in active learning (Boyle et al., 2005); (d) Collective participation of teachers from the same grades and or subject (Snow-Renner & Lauer, 2005); and (e) Delivery with an extended duration (Jeanpierre et al., 2005). While one of the main focuses of this professional development program was to get teachers to use *FLP* lesson plans and activities, it was also structured by the five key characteristics of effective professional development as discussed in the review of literature.

Evaluating the continued of professional development materials is seldom done. This form of evaluation is a higher level of evaluation. This study and the SIS model is a start. While the *FLP* professional development program offered instruction in pedagogy as well as specific lesson plans and activities, this preliminary research began looking at the use of specific lesson plans and activities rather the use of pedagogical strategies which are more difficult to measure. The SIS model was effective at this level of measurement, but it is feasible to assume that it could also be used to measure the continued use of teaching strategies as well.

## Selected Personal and Professional Characteristics

The review of literature on teacher professional development programs indicates

that several demographic variables are often indicators of continued use (Schonlau et al., 2002) . This study looked at the following demographic characteristics: gender, number of years teaching, highest degree earned, type of teaching license, grade level teaching, size of community where they are teaching, the percentage of low SES students as measured by the number eligible for free or reduced lunch, percentage of non-white students at the school, and whether the school of the participant had met AYP the year the participant took the *FLP* program.

This study found two demographic variables that were statistically significant in Group 1, no significant variables in Group 2, and one significant variable in Group 3. Each of the demographic variables was analyzed in a multiple regression using total SIS scores as independent variables. The SIS scores in each group were statistically similar and indicate that participants from each group had used between 8-12 lessons or activities each year following the professional development program. Having a low number of significant variables is a sanguine phenomenon because fewer significant items indicate that the program is working for a wide demographical population. If the analysis had found a high number of significant variables, this would mean that the program was mainly being implemented by a narrow population group and could not be considered effective on a large scale.

In Group 1, there were two demographic variables that were statistically significant. The number of years teaching experience and the type of license the teacher held were both significant variables affecting continued use. In Group 2 none of the demographic items were found to be significant. In Group 3, the only statistically

significant variable was the number of years teaching. While it is possible that the other demographic variables were factors on whether participants continued to use *FLP* materials, they were not statistically significant.

*Teaching Experience*

The more experienced teachers in this study were more likely to continue using materials after the professional development program. There are several reasons why the amount of teaching experience may have been a significant variable in two of the groups. One reason is that experienced teachers have increased levels of confidence in their teaching abilities, and thus are more likely to try new lesson plans and activities (Appleton, 1999). Confidence in teaching abilities normally increases with experience. Thus, an experienced teacher is often willing to try new pedagogical practices and vary the curriculum in the classroom

Another possibility is that experienced teachers are looking for new ways to energize their teaching and will use new lesson plans and activities to facilitate this desire (Remillard, 1999). Remillard explained that experienced teachers often consider their students' needs when selecting the curriculum to be used in the classroom. This is in contrast to new teachers who focus on their own teaching likes when choosing curriculum.

A third possible reason is that more experienced teachers readily recognize lesson plans and activities that can add to the students learning experiences (Appleton & Kindt, 2002). Experienced teachers could be considered more intelligent consumers of educational innovations and curricular materials that will be effective with students.

Teacher's selection of teaching curriculum is often decided by factors such as what the school wants and on existing classroom practice. Further, Appleton and Kindt explain that more experience teachers more often choose curriculum based on the needs of their students.

*Teaching License*

The type of teaching license was found to be significant in Group 1. According to the statistical analysis, teachers who held Utah Level 2 or Utah Level 3 licenses were statistically more likely to continue using items from the *FLP* professional development program. There are several possible reasons that the type of license was significant.

One possible reason is that Utah Levels 2 and 3 licenses are only given to teachers who have taught for 3 or more years. As discussed earlier, experienced teachers more often use new curriculum materials while inexperience teachers are more reluctant to try new curriculums.

A second possible reason for the significance found is that teachers who have earned Levels 2 or 3 licenses are required to have completed 100 hours of professional development training. Individuals who have experienced a great deal of professional development may feel more comfortable working with new materials (Appleton, 1999), or are able to recognize lesson plans that will help increase learning in their students (Appleton & Kindt, 2002).

*Nonsignificant Demographic Variables*

*Gender.* While gender was not a significant variable in this study, it may have

been because there were only four male participants. This phenomenon is typical of elementary schools. Females make up the greater population of elementary school teachers (Cunningham & Watson, 2002; Mills, Martino, & Lingard, 2004). Had this study been performed with middle school, junior high, or high school teachers where the distribution of male/female teachers is much closer balanced, the results may have been different.

*AYP*. Another variable that was not significant in this study but could be in other studies was whether the school had met AYP the year the participant took the *FLP* program. In this study five participant's schools had not met AYP and four participants taught at private schools that were not subject to AYP. The disparity between the number of schools meeting and not meeting AYP greatly influenced significance. In fact, the regression model was not able to count AYP in the analysis for Group 1 because there were not any participant's schools that had not met AYP. It would be interesting to see whether AYP would be significant in a population that had a balanced AYP variable. Schools that repeatedly do not meet AYP are subject to state imposed sanctions such as, requirements to provide student tutoring, student's choice of which school they attend, or even school administration takeover by the State Department of Education.

AYP is primarily determined through the use of student standardized testing (Cochran-Smith, 2005). Thus schools that have not met AYP are prone to put extra pressure on teachers to ensure not only that their students pass the tests, but that they make substantial improvement in their test scores. Many districts and schools dictate the curriculum that is to be taught and teachers are no longer allowed to choose their own

curricular materials (Cobb, 2005). Cobb further explained that many schools that do not make AYP are now dictating and requiring professional development training in specific content areas. This new level of management does not allow teachers the freedom to choose and teach the curriculum of their choice.

*Percent of low SES students.* The percent of low SES students at the schools of the participants were not statistically significant variables in whether participants continued to use *FLP* materials. Teachers who teach at schools with high numbers of low SES students often experience a different curriculum than teachers at schools with higher SES students (Duke, 2000). Duke found major differences between low SES schools and high SES schools in the areas of the amount of printed materials such as books and magazines and the quality of the material. Low SES schools did not have as many printed items such as books and magazines, and the quality of the printed materials was of much lower quality than at schools with higher SES.

*Percent of non-White students.* The percent of non-White students was not a statistically significant variable influencing participant continued use. In a study by Lubienski (2002), disparity was found between the number and types of courses being offered at schools with high numbers of non-White students. In addition to the lack of higher level courses, teachers at non-White schools spent less time teaching reasoning skills and relied heavier upon multiple choice testing. Teaching at schools with high numbers of non-White students could be a factor influencing whether teachers use professional development materials in their classrooms.

*Size of community.* The size of the community where the participants teach was

not a statistically significant variable in whether participants continued to use *FLP* materials in this study. The variable was investigated because the literature indicated that the size of the community is another variable that lets us know school. Larger communities often have a larger financial base than smaller schools (Lee, Smerdon, Alfeld-Liro, & Brown, 2000). The amount of revenue at a school often determines the amount of materials and additional supplies a teacher has access to. Often teachers working in smaller communities are dependent upon their own resourcefulness to acquire and use extra teaching materials. In this study, size of community was not a variable of significance.

*Grade level.* The grade level the participants teach was not a statistically significant variable in whether participants continued to use *FLP* materials. While not significant in this study, the grade level a teacher teaches can influence the experiences of that teacher. Teachers at each grade level experience students differently as the students are at differing developmental levels (Geary & Bjorklund, 2000). The developmental differences between children at each grade level can be quite substantial resulting in substantially differing experiences for the teachers of different grade levels. In looking at the *FLP* curriculum, a question of interest was whether there were differences in continued use by grade level. If this had been the case, a closer examination of the curriculum (lesson plans and activities) would have been warranted. However, statistical analysis indicated no differences.

*Highest degree.* The highest degree obtained by the participants in this study was not statistically significant in whether participants continued to use *FLP* materials. The

*FLP* professional development program taught specific content and then promoted using pre-made lesson plans to teach this content. It is possible that the highest degree obtained was not significant because the participants who had earned advanced degrees had received specialized training in their content areas through their degree programs and thus did not believe that the professional development content lessons would provide their students with any advantage over the current curriculum. If this variable had been significant, additional investigation into the variable could be warranted.

## Online Professional Development

Online professional development has been making great headway in educational arenas (Newton, 2003). The review of the literature reported that evaluations of traditional professional development programs needed to be structured by five key characteristics in order to be considered effective. Yet, most evaluations of effectiveness only occurred at the lower levels of participant satisfaction and participants increasing in knowledge. This study took evaluation to the higher level of participants continued use. Evaluation on the level of continued use is especially important because use can in turn cause increased student achievement. Student achievement is the highest level of evaluation, but professional development programs cannot influence increased student achievement unless the professional development participants have made changes in their teaching practices (Bredeson, 2003). Not only did this study evaluate the level of continued use of materials from a professional development program, this study evaluated an online professional development program that was structured by the five key

characteristics of professional development.

*FLP* professional development program has a short history (3 years) of implementation. It has been subject to unforeseen changes in instructors, computer and technological compatibility, and time constraints for recruiting new participants. Despite these challenges, *FLP* seems to have been successful as an online professional development program as measured by the amount of lesson plans and activities participants have continued to use since the professional development experience. Of the 65 responding participants, only eight people did not report using any lessons or activities in the years following their enrollment in *FLP* while the remaining 57 participants had total SIS scores ranging from 3 to 184.

The *FLP* professional development was structured by the five characteristics needed to be considered effective. Yet what *FLP* is different than many other professional development programs because it provides its participants with ready-to-use lesson plans and activities. Each lesson plan and activity can be accessed via the internet. As part of the professional development experience, participants chose various lesson plans and activities to use in their classroom. After completing the lesson or activity the participant recorded their successes and failures with the lesson or activity and posted online where other participants could read about them.

## Conclusions

One of the most important outcomes of this research study was providing an evaluation model for measuring the effectiveness of a professional development program

that provides teachers with specific lesson plans and activities that they can implement directly in their classrooms. The SIS model was effective in creating weighted scores by which to compare individual responses within groups and across groups. These scores represent the amount of continued use of professional development materials. This model could be used to measure continued use of materials as is the case in this study, but could also be used to quantify the level of continued use of a variety of pedagogical strategies or philosophies. The use of the SIS model in evaluating the effectiveness of professional development programs in relation to participants continued use is valuable.

It is hard to identify by survey any external variables that could influence whether participant groups in different years will implement and continue to use professional development materials. The analyses performed in this study were conducted for each group individually, thus affirming the significance of each recognized variable.

The *FLP* professional development program can be deemed successful in promoting continued use of materials as determined by the SIS scores of each group of participants. There was a general trend of increasing SIS scores each subsequent year following the professional development experience. The positive trend demonstrates that participants are likely to continue using materials from the *FLP* professional development program.

## Future Recommendations

This research has raised several new questions about professional development programs. A large limitation of this study is that it was not able to evaluate the

professional development program at the highest level, ‘student achievement’. This study began three years after *FLP* had been implementing its professional development program. Because of this, it was not feasible to determine if student achievement had increased. A future study would begin before the professional development program was implemented and could include a variety of methods to measure the increase in student achievement. One possible method would be to have the students of participants take pre and posttests in the subject area of the professional development. A second method would be to collect any standardized student test scores pre and post professional development. An optimal study would measure both “participants continued use” and “increased student achievement” in conjunction with each other.

A follow-up study to this one would be very beneficial. The SIS scores in this study indicate that participants have and will continue to use *FLP* course materials. But the big question is; how long they will continue to use them? A follow-up study conducted three or more years later would be a way to answer this question. Comparing current SIS scores and future SIS scores would let us know if the participants have continued to implement and use program materials. In addition, it would be beneficial to follow-up with the participants that have continued to use *FLP* curriculum in a qualitative manner. Through the process of interviewing participants, we would be able to determine more accurately the factors according to the participants that influenced their continued use.

Another valuable study to conduct would be to compare a traditional face-to-face professional development program with an identical professional development program

delivered online. The two varieties of professional development would need to teach the same content, provide equal number of hours in training, facilitate opportunities for participants to collaborate with others similar to themselves, integrate the same teaching practices and pedagogy, and engage the participants in active learning. This type of study would give credence and a base of reference by which to compare the effectiveness of online professional development programs and traditional professional development programs.

A fourth area of research that would be valuable and contribute to the greater understanding of professional development programs would be to measure the effectiveness of online delivery and the population groups that respond best to online delivery. Although this idea is similar to the prior suggestion, it would not require a comparison professional development program. Participants would evaluate the online environment of the professional development highlighting particular components that either did or did not work well.

A final idea for further research would be to use the SIS model to assess the effectiveness of other professional development programs in the areas of continued use of teaching practices and ideas. This is different from the current study, because the current study was conducted on a professional development program that gave participants lesson plans and activities to use in their classrooms. It did not measure pedagogical practices. Many professional development programs do not give participants ready-to-use materials, rather they teach participants theories of teaching and allow participants to implement these theories into their teaching practices.

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# APPENDICES

# Appendix A

## Additional Teacher Projects

# Additional Teacher Projects

- *Guest Speaker:* Invite a guest speaker to visit their class and report how this presentation enhanced course curriculum.

- *Website Review:* Identify five websites related to the course lesson plans and/or classroom activities, and explain their usefulness for other teachers. Share your results with the instructor and other course members via email.

- *Bulletin Board:* Design a course-related bulletin board to display in your classroom. Submit a JPG image and a description of the display.

- *Video Review:* Review an Agriculture in the Classroom video (noted in your grade level) that you have viewed with your students, and explain how this video enhanced classroom instruction.

- *Service-learning Project:* Develop a project that provides students with an opportunity to provide a service and learn at the same time. Ideas include gardening services for the school or local nursing home, composting at the school and then donating the product, etc. This project should extend beyond the classroom and into the community. The activity needs to be congruent with the purposes of the Food, Land & People Course. Please have your project approved by the course instructor prior to beginning. A minimum of five JPG images to document the activity must accompany the project form.

- *Embryology Event:* Hatch chicks in your classroom and provide instruction on the lifecycles of animals, needs of living organisms, or embryo development. (The course instructor can help you obtain fertile eggs and other classroom resources.)

- *Selected Readings Reflections:* From a list on the course website (under the Projects link), read an article and submit your comments, including how the information could be included in a lesson plan from the course. Comments may also include opinions and concerns, and suggested solutions to the problems presented in the reading. Your comments will be shared with others in the course.

- *Define Agriculture:* Define agriculture with your students and submit your method for conveying the concepts of agriculture. Use the resources you learned about in the *Orientation Workshop*. Assess what your students know about agriculture both before and after the activity. You may use agricultural literacy quizzes on the Utah Agriculture in the Classroom website, or use a performance-based assessment, e.g., “draw a picture of what agriculture means to you.”

- *National Agriculture Day Class/School Activity:* National Agriculture Day is the first day of spring. That week is also celebrated as National Agriculture Week. Plan an activity or event(s) that will celebrate this day or week. Submit an outline of your activity or event(s) on the form, and a minimum of five JPG images to document the event.

- *School Garden:* Develop an indoor or outdoor school gardening project to teach plants, water, lifecycles, soils, weather, nutrition, simple machines, native plants, heredity, microorganisms.

# Appendix B

## Food, Land, and People (ASTE 6400) Course Syllabus

*Food, Land, and People* (ASTE 6400) Course Syllabus

**Utah Agriculture in the Classroom**
**Food, Land, and People ASTE 6400**
**Syllabus and Course Outline**

**Program Coordinator:**
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Email: vanaem@ext.usu.edu
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**Online Course Instructor:**
Grace Struiksma
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**Description**
The Food, Land & People (FLP) course has been developed for the K-6 educator to increase knowledge about agricultural/environmental literacy while meeting statewide mandatory curriculum standards in science, social studies and healthy lifestyles. The course content provides teachers with research-based strategies to implement in their classrooms and is complete with integration strategies for teaching language arts and mathematics. Teachers may earn 1-3 Utah State University semester credit(s). FLP is an independent study year-long course. Enrollees may take up to one year to complete course requirements. The course is Pass/Fail and will become part of your official Utah State University transcript.

**Prerequisite Orientation Workshop and Fee**
Enrollment in the course requires teachers to participate in a three-hour onsite *Orientation Workshop*. Teachers may register for the online course within three months of completing either the onsite or online orientation. *Orientation and online course fees are not refundable.*

**Onsite Orientation Workshop**
Teachers who choose to participate in an onsite *Orientation Workshop* need to register online seven days prior to the session, the onsite *Orientation Workshop* fee is $10. Onsite Orientation Workshop sessions are scheduled throughout the year; check the website for locations and dates. Onsite *Orientation Workshop* participants will receive a certificate documenting three hours of training for licensure credit.

**Expected Course Outcomes**
Teachers will have access to numerous classroom resources including kits, bulletin boards, DVDs/videos, books, software, maps, and lesson plans on a variety of topics such

as soils, seeds, plants, animals, heredity, microorganisms, geography, nutrition, and ancient world foods. In addition to meeting state guidelines, the resources are designed to promote environmental awareness, critical thinking, problem-solving skills, cooperative attitudes, and an appreciation for cultural differences. Meaningful activities and well-defined objectives enhance teaching skills, instructional strategies, and content knowledge concerning social studies, science, and healthy lifestyles with food, land, and people as course themes. Upon completion of this course, students will be able to:

- Explain how agricultural concepts (soils, plants, animals, production, economics, microorganisms and food science, weather, agricultural technology) are integrated into state standards for science, social studies and healthy lifestyles.
- Demonstrate several instructional strategies including hands-on inquiry methods.
- Explain why agriculture is as important today as it was 100, 1,000, or 10,000 years ago.
- Identify scientific advances that have changed cultures and societies.
- Navigate the Utah Agriculture in the Classroom (AITC) website, www.agclassroom.org/ut, and download or order grade-level appropriate classroom resources.
- Identify how content in science, social studies, and healthy lifestyles is applied to real-world issues concerning food, land, and people.

**Hardware & Software Requirements**
An updated browser is required to access the course through Utah State University's WebCT system. Adobe Acrobat Reader must be installed on your computer to view lesson plans, newsletter articles, and classroom activities. Media Player/Real/QuickTime is required to view movie clips. The links to these *free* software downloads are located on the USU WebCT login page and the course homepage. Access to a digital camera will be necessary to complete some of the course projects.

**Online Course Fees**
Course fees are variable and are determined by the number of credits desired. Teachers enrolling in the online course will receive their Banner ID and login information via email. Enrollees will receive the entire course content (all lesson plans, etc.) on CD and will receive a free updated CD every school year upon successful completion of the course.

| Credit(s) | Utah Teachers (Pass/Fail) EDUC 5560 | Outside of State (Pass/Fail) EDUC 5560 | Graded Credit ASTE 6400 |
|---|---|---|---|
| 1 | $60 | $130 | $240 |
| 2 | $90 | $160 | $480 |
| 3 | $120 | $190 | $720 |

**Course Requirements**
This course is graded as pass (P) or fail (F). Credits earned are determined by: **1)** number

of completed projects and Project Forms, **2)** number of hours spent in classroom instruction using the materials and completed Journal Forms, and **3)** completion of the final Strategy Report.

The requirements for credit(s) are as follows:

| Credit(s) | Projects (Project Forms) | Classroom Instruction (Journal Forms) | Final Strategy Report (Strategy Report Form) |
|---|---|---|---|
| 1 | 2 | Minimum of 8 hours | Required |
| 2 | 3 | Minimum of 18 hours | Required |
| 3 | 4 | Minimum of 28 hours | Required |

**Projects**
Teachers will complete the required number of projects based upon the number of credits for which he or she has registered. **All teachers must complete the *Required* Project before making other project selections.** Submit a ***Project Form*** after you complete each project. The ***Project Form*** link is located on the course menu. *Your summary, sent to your instructor via the Project Form, may be shared with other teachers in the course*.

| Credit(s) | Number of Projects to Complete |
|---|---|
| 1 | 2 |
| 2 | 3 |
| 3 | 4 |

***Required Project:*** Visit the Faculty Room section of the course and identify at least one tip, or idea you think is useful. Next, send an email message, using the email tool in WebCT, to your instructor letting her know which tip, or idea you liked. In the message, be sure to introduce yourself; include your name, the school name where you teach, some of the school's demographics, the grade level you teach, and anything else you want to share. ***Most importantly***, a picture of you must be attached (JPG file).

***Other Possible Projects:***

- **Guest Speaker:** Invite a guest speaker to visit your class and report how this presentation enhanced course curriculum.
- **Website Review:** Identify five websites related to the course lesson plans and/or classroom activities, and explain their usefulness for other teachers.
- **Bulletin Board:** Design a course-related bulletin board to display in your classroom. Submit a JPG image and a description of the display.
- **Video Review:** Review an AITC video (noted in your grade level) that you have

viewed with your students, and explain how this video enhanced classroom instruction.

- **Selected Reading Reflection:** From a list on the course website (under the Projects link), read an article and submit your comments, including how the information could be included in a lesson plan from the course. Comments may also include opinions and concerns, and suggested solutions to the problems presented in the reading. The reflection should be brief—two paragraphs to one page in length.
- **Service-learning Project:** Develop a project that provides students with an opportunity to provide a service and learn at the same time. Ideas include gardening services for the school or local nursing home, composting at the school and then donating the product, etc. This project should extend beyond the classroom and into the community. The activity needs to be congruent with the purposes of the Food, Land & People Course. Please have your project approved by the course instructor prior to beginning. A minimum of five JPG images to document the activity must accompany the project form.
- **Define Agriculture:** Define agriculture with your students and submit your method for conveying the concepts of agriculture. Assess what your students know about agriculture both before and after the activity. You may use agricultural literacy quizzes on the Utah AITC website, www.aclassroom.org/ut or use a performance-based assessment, e.g., "draw a picture of what agriculture means to you." This project is outlined in a lesson plan that can be found by click here. A minimum of five JPG images to document the project must accompany the project form.
- **National Agriculture Day Class/School Activity:** National Agriculture Day is the first day of spring. That week is also celebrated as National Agriculture Week. Plan an activity or event(s) that will celebrate this day or week. Submit an outline of your activity or event(s) on the form, and a minimum of five JPG images to document the event.
- **Embryology Event:** Hatch chicks in your classroom and provide instruction on the lifecycles of animals, needs of living organisms, or embryo development. (The course instructor can help you obtain fertile eggs and other classroom resources.) Any instruction related to this project may be counted as Classroom Instruction hours. A minimum of five JPG images to document the event must accompany the project form.
- **School Garden:** Develop an indoor or outdoor school gardening project to teach plants, water, lifecycles, soils, weather, nutrition, simple machines, native plants, heredity, microorganisms. This is quite an undertaking, so the development of the garden is the project and all of the instruction done to use the garden resource should be counted as Classroom Instruction hours. A minimum of five JPG images to document the project must accompany the project form.

**Classroom Instruction**

Lesson plans, activities, and other classroom resources available on the course website

will be used to complete the Classroom Instruction hours. All of the instructional materials for the course have been correlated with state standards in the areas of science, social studies, and healthy lifestyles with integration of language arts and mathematics. In addition to lesson plans, the available materials include hands-on activities, DVDs/videos, PowerPoint presentations, and literature suggestions. Teachers will determine which lesson plans, activities, and other resources they will use. Classroom Instruction hours must be documented using the online ***Journal Form***. The hours reported on the ***Journal Forms*** are totaled and displayed on the ***Student Progress*** link. Upon completion of each lesson plan (which may span a week or more), complete the ***Journal Form*** (located on the course homepage). The ***Journal Form*** requires the following information be complete: 1) lesson plan title, 2) number of classroom instructional hours spent on this lesson, 3) number of students in the classroom, 4) strength of the lesson and/or improvement suggestions, 5) additional classroom activities conducted, and 6) integration strategies or other resources used with the lesson.

**Final Strategy Report**

The ***Final Strategy Report*** must be completed within one year of starting the course. This report is completed using the ***Final Strategy Report*** form found on the main navigation of the course homepage. The ***Final Strategy Report*** form asks you to *"Outline your strategy for implementing Food, Land & People and Agriculture in the Classroom concepts, lesson plans, and activities into your classroom in the future."* The response to this question should include specifics about what lessons, activities, teaching and instructional strategies, and other integration tactics you plan to use in your curriculum during the next year. Report examples can be viewed from a link on the ***Final Strategy Report*** form page.

**Grades**

Grades will be posted immediately after the ***Final Strategy Report*** is evaluated and accepted. The course instructor will send you an email notification that your grade has been posted, but it may take a week before this grade change shows up on your USU official transcript. A letter of completion and a course CD will be mailed to your school address.

**Course Audit Policy**

*Please read the following bullets carefully to make sure that auditing the course is right for you. Course registrations cannot be altered after payment has been received.*

- Individuals wishing to audit the online course are NOT required to register with Utah State University. Please contact a course instructor directly for registration and course materials. The prerequisite orientation and $10 orientation fee are still required for auditing students.
- Each auditing student will purchase a CD-ROM version of the course content for $40; no other fees will be applicable.
- Students auditing the course will receive NO grade or acknowledgement on an

unofficial or official Utah State University transcript.
- Audit students will receive course materials distributed throughout the period of a year-long course, but will not be included on the course email contact list. Audit students must also request a final updated version of the course CD following the year's end—one will not be automatically provided.

**Welcome to the Food, Land & People Faculty Room!**

Get comfortable and get ready to view some fabulous tips and ideas to use in your classroom.

Here you can obtain ideas or tips submitted by other teachers. Send your favorite idea or tip to at least two other teachers and your instructor. In the message to your instructor, be sure to include an introduction of yourself (your name, name of your school, grade level you teach, and anything else you want to share). Here is what you need to do:

1. Use the e-mail tool to send your favorite idea or tip and introduction of yourself to your instructor.
2. Use your e-mail program, such as Eudora, Outlook Express, Hotmail, Yahoo, etc., on your computer to send your favorite idea or tip to other teachers. You are not required to send your favorite tips and/or ideas to other teachers enrolled in the course. You are also not required to do your selected activity for project completion, although it may be a great place to start!

Click on one of the following links to see Teacher Tips.

Special Education
Music Education
Kindergarten
First Grade
Second Grade
Third Grade
Fourth Grade
Fifth Grade
Sixth Grade

**Reflection Report Journal Form**

Use the form below to submit your reflection report journal.

**IMPORTANT:** Students (teachers) will track their progress by updating the on-line "Reflection Journal." Journal hours will be logged and displayed on "Student Progress" link. This on-line journal form should be completed by the student upon the completion of each lesson plan (which may span a week or more). This journal form will ask for the following information:

- The lesson plan title
- The number of classroom instructional hours
- The number of students in the classroom
- Strength of the lesson and/or improvement suggestions
- Additional classroom activities conducted
- Integration strategies or other resources utilized with the lesson

Name:

E-mail:

The lesson plan title:

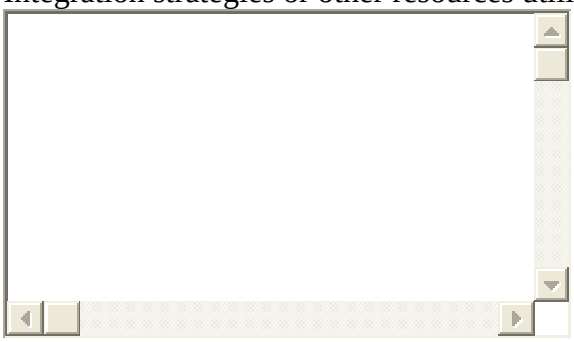
The number of classroom instructional hours

The number of students in the classroom

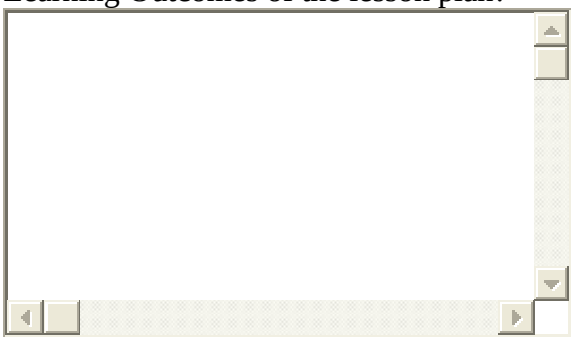
Strength of the lesson and/or improvement suggestions

Additional classroom activities conducted

Integration strategies or other resources utilized with the lesson



What evidence do you have that your students understand the objectives or Intended Learning Outcomes of the lesson plan?



# Appendix C

## Food, Land, and People Participant Survey

Food, Land, and People Participant Survey

Instructions: Please take a few minutes to complete the following survey.

**Section I: Demographics**

1. What is your gender?
   _____Male
   _____Female
   _____Decline to respond

2. What is your age?
   _____

3. Counting this school year, how many years have you been teaching school?
   _____

4. What is the highest degree you have obtained?
   _____Bachelors
   _____Masters
   _____Education Specialist
   _____Doctorate

5. Which type of teaching license do you hold?
   _____Utah Level 1
   _____Utah Level 2
   _____Utah Level 3
   _____None
   _____Other (Pleases Specify)_____

6. Which area of licensure concentration do you hold? (Check all that apply)
   _____Elementary
   _____Secondary
   _____Early Childhood
   _____Special Education
   _____Special Education (birth-5 yrs)
   _____Administrative/Supervisory
   _____Career and Technical Education
   _____School Counselor
   _____Communication Disorders
   _____School Psychologist
   _____School Social Worker
   _____Other (Please specify)_____

7. What grade level do you primarily teach? (Check all that apply)

_____Pre-K
_____1st
_____2nd
_____3rd
_____4th
_____5th
_____6th

8. Which academic school year did you complete *Food, Land, and People* (ASTE 6400)?

_____2003-2004
_____2004-2005
_____2005-2006
_____2006-2007

**Section II: Food, Land, and People Information**

1. Please check the box indicating which **Lesson Plans** you used with your **Pre-K Student**s from the **Food, Land, and People (ASTE 6400)** curriculum for each subsequent year following having taken *Food, Land, and People*.

| Lesson Title | 2004-2005 Academic Year | 2005-2006 Academic Year | 2006-2007 Academic Year |
|---|---|---|---|
| Animal Names | | | |
| Better Butter | | | |
| Color, Cut, and Paste | | | |
| Colors on the Farm | | | |
| Exploding Cheeseburger | | | |
| Favorite Foods | | | |
| Four Seasons | | | |
| Fruity Counters | | | |
| Greedy Cat's Breakfast | | | |
| How a Seed Grows- and Who Grows It? | | | |
| Lunchtime Favorites | | | |
| Need to Eat 5 A Day | | | |
| Outdoor Observation | | | |
| Pumpkin, Pumpkin | | | |
| School Ground Caretakers | | | |
| Seasons Through the Year | | | |
| The Little Red Hen | | | |
| The Texture of Timber | | | |
| Those Amazing Earthworms | | | |
| Vacation Matrix | | | |
| Vegetable Twister | | | |
| What's Your Favorite Season | | | |
| Where Do They Grow | | | |
| Where Is Agriculture? | | | |
| Who's Who | | | |
| | | | |

2. Please check the box indicating which **Additional Activities** you used with your **Pre-K Students** from the **Food, Land, and People (ASTE 6400)** curriculum for each subsequent year following having taken *Food, Land, and People*.

| Activity Title | 2004-2005 Academic Year | 2005-2006 Academic Year | 2006-2007 Academic Year |
|---|---|---|---|
| About Books | | | |
| Agricultural Pop-ups | | | |
| Animal Facts | | | |
| Baby Lamb | | | |
| Cattle | | | |
| Chicken and Egg | | | |
| Chickens | | | |
| Count Your Way Through Mexico | | | |
| Earthworms on Parade | | | |
| "F & V's" Are Different | | | |
| Homes | | | |
| I Can Make a "Dip" | | | |
| I know the Difference | | | |
| K-2 Core Connections | | | |
| New F's and V's I tried | | | |
| One Fine Day | | | |
| Ostriches | | | |
| Sheep | | | |
| Sheep Crossing | | | |
| Tasting new F's and V's | | | |
| Three Cheers for Katherine the Great | | | |
| Time to Wash Hands | | | |
| Too Many Tamales | | | |
| Who Makes the Best Burger? | | | |
| | | | |

3. Please check the box indicating which **Lesson Plans** you used with your **1st Grade Students** from the **Food, Land, and People (ASTE 6400)** curriculum for each subsequent year following having taken *Food, Land, and People*.

| Lesson Title | 2004-2005 Academic Year | 2005-2006 Academic Year | 2006-2007 Academic Year |
|---|---|---|---|
| Egg Maze: Counting by Twos, Threes & Fives | | | |
| Fainting Goats | | | |
| Agriculture Counts | | | |
| Australian Resources | | | |
| Better Butter | | | |
| Breads Around the World | | | |
| Buzzy, Buzzy Bee | | | |
| Chewsy Choices | | | |
| Color, Cut, and Paste | | | |
| Countries, Food, and Culture | | | |
| Eat Smart With My Pyramid for Kids | | | |
| Exploding Cheeseburger | | | |
| Exploring My Pyramid for Kids | | | |
| Fruits and Veggies | | | |
| How a Seed Grows – And Who Grows it? | | | |
| How Does Your Garden Grow? | | | |
| Lunchtime Favorites | | | |
| My Little Seed House | | | |
| Need to Eat 5 A Day | | | |
| Nuts About Peanuts | | | |
| Our Basic Foods | | | |
| Plants Love Air | | | |
| Pumpkin, Pumpkin | | | |
| Ready, Set, Plant | | | |
| Root, Root, for Life | | | |
| School Ground Caretakers | | | |
| Seasons Through the Year | | | |
| Seed Search | | | |

| | | | |
|---|---|---|---|
| Seed Surprises | | | |
| The Little Red Hen | | | |
| The Plant-n-Me | | | |
| Those Amazing Earthworms | | | |
| Vary Your Veggies and Focus on Fruit | | | |
| Vegetable Twister | | | |
| Weaving Wool | | | |
| Where Do They Grow | | | |
| Where is Agriculture? | | | |
| | | | |
| | | | |

4. Please check the box indicating which **Additional Activities** you used with your **1st Grade Students** from the **Food, Land, and People (ASTE 6400)** curriculum for each subsequent year following having taken *Food, Land, and People*.

| Activity Title | 2004-2005 Academic Year | 2005-2006 Academic Year | 2006-2007 Academic Year |
|---|---|---|---|
| Agricultural ABC's | | | |
| Agricultural Pop-ups | | | |
| Animal Facts | | | |
| Australian Population, Geography, Natural Resources, & Agricultural Map | | | |
| Benefits Mobile | | | |
| Coconut Float | | | |
| Earthworms on Parade | | | |
| "F & V" Bingo | | | |
| Hamburger Plant | | | |
| Homes | | | |
| I Can Make a "Dip" | | | |
| I Know the Difference | | | |
| K-2 Core Connections | | | |
| Know & Show Sombrero | | | |
| Leaf-and-Seed-Sort Information Chart | | | |
| New "F &V's" I Tried | | | |
| Oh, The Places You'll Go | | | |
| One Fine Day | | | |

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|---|---|---|---|
| P.L.A.N.T. Needs | | | |
| Peanut Plant Kit | | | |
| Picture Yourself a Plant | | | |
| Pizza Time Bulletin Board | | | |
| Plant Parts Rap | | | |
| Plant Parts We Eat | | | |
| Plant People | | | |
| Power Seeds | | | |
| Seed Science | | | |
| Sheep Crossing | | | |
| Tasting New “F &V’s” | | | |
| Thank a Farmer for Pizza | | | |
| The Choo-Choo Song | | | |
| The Garden Show | | | |
| The Great Pumpkin | | | |
| The Medicine Plant | | | |
| Three Cheers for Catherine the Great | | | |
| Time to Wash Hands | | | |
| Touch & Tell | | | |
| Weather Harvest Game | | | |
| What is a Fruit? | | | |
| What is a Vegetable? | | | |
| Who Makes the Best Burger | | | |
| You’re Aboard Spaceship Earth | | | |

5. Please check the box indicating which **Lesson Plans** you used with your **2nd Grade Students** from the **Food, Land, and People (ASTE 6400)** curriculum for each subsequent year following having taken *Food, Land, and People*.

| Lesson Title | 2004-2005 Academic Year | 2005-2006 Academic Year | 2006-2007 Academic Year |
|---|---|---|---|
| A Day Without Agriculture | | | |
| Ag Pays | | | |
| Agriculture Counts | | | |
| Breads Around the World | | | |
| Build a Burger | | | |
| Buzzy, Buzzy Bee | | | |
| By the Way | | | |
| Chewsy Choices | | | |
| Color Your Plate | | | |
| Countries, Food & Culture | | | |
| Eat Smart With MyPyramid for Kids | | | |
| Egg Maze: Counting by Twos, Threes & Fives | | | |
| Fainting Goats | | | |
| Food Distribution and Preservation | | | |
| Gala Fiesta Jamboree | | | |
| In the Good Old Days | | | |
| Lunchtime Favorites | | | |
| Lunchtime Favorites | | | |
| Mali, Africa, and Agriculture | | | |
| Mystery “F &V’s” | | | |
| Nuts About Peanuts | | | |
| Pumpkin, Pumpkin | | | |
| Ready, Set, Plant | | | |
| Schoolground Caretakers | | | |
| Seasons Through the Year | | | |
| Source Search | | | |
| The Little Red Hen | | | |
| Those Amazing Earthworms | | | |

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|---|---|---|---|
| Tomatoes to Ketchup, Chickens to Omelettes | | | |
| Tools of the Time | | | |
| Understanding MyPyramid | | | |
| Vary Your Veggies and Focus on Fruit | | | |
| Vegetable Twister | | | |
| What Does Ag Have to Do With Me? | | | |
| Who Needs Agriculture? | | | |
| Who's Hungry | | | |
| Why are People Hungry | | | |
| | | | |

6. Please check the box indicating which **Additional Activities** you used with your **2nd Grade Students** from the **Food, Land, and People (ASTE 6400)** curriculum for each subsequent year following having taken *Food, Land, and People*.

| Activity Title | 2004-2005 Academic Year | 2005-2006 Academic Year | 2006-2007 Academic Year |
|---|---|---|---|
| Agricultural ABC's | | | |
| Agricultural Pop-ups | | | |
| Animal Facts | | | |
| Earthworms on Parade | | | |
| "F &V" Bingo | | | |
| I Can Make a "Dip" | | | |
| K-2 Core Connections | | | |
| Mr. Bumble | | | |
| New "F & V's" I Tried | | | |
| Oh, The Places You'll Go | | | |
| Peanut Butter and… | | | |
| Peanut Plant Kit | | | |
| Sheep Crossing | | | |
| Snooty Fruit | | | |
| Snow Comes to the Farm | | | |
| The Garden Show | | | |

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|---|---|---|---|
| The Little Red Hen | | | |
| The Turkeys Go on Strike | | | |
| Time to Wash Hands | | | |
| Visits with a Vet | | | |
| Weather Harvest Game | | | |
| What is a Fruit? | | | |
| What is a Vegetable? | | | |
| When the Bees Fly Home | | | |
| Who Makes the Best Burger? | | | |
| You're Aboard Spaceship Earth | | | |
| | | | |

7. Please check the box indicating which **Healthy Lifestyles Lesson Plans** you used with your **3rd Grade Students** from the **Food, Land, and People (ASTE 6400)** curriculum for each subsequent year following having taken *Food, Land, and People*.

| Lesson Title | 2004-2005 Academic Year | 2005-2006 Academic Year | 2006-2007 Academic Year |
|---|---|---|---|
| Chewsy Choices | | | |
| Does Your Diet Stack Up? | | | |
| Food Math | | | |
| Lunchtime Favorites | | | |
| MyPyramid for Kids | | | |
| Understanding MyPyramid | | | |
| Vary Your Veggies and Focus on Fruits | | | |
| Vegetable Twister | | | |
| What's the Shape of Your Diet? | | | |
| Who's Hungry | | | |
| Why are People Hungry? | | | |
| | | | |

8. Please check the box indicating which S**cience Lesson Plans** you used with your **3rd Grade Students** from the **Food, Land, and People (ASTE 6400)** curriculum for each subsequent year following having taken *Food, Land, and People*.

| Lesson Title | 2004-2005 Academic Year | 2005-2006 Academic Year | 2006-2007 Academic Year |
|---|---|---|---|
| A Worm's World | | | |
| Big Tree, Little Tree | | | |
| Gravity and Layers of Air | | | |
| Made to Move: Simple Machines | | | |
| Potato Candle | | | |
| Profit From Pumpkins | | | |
| Sunlight and Warm Air | | | |
| Terrariums | | | |
| Those Amazing Earthworms | | | |
| | | | |

9. Please check the box indicating which **Social Studies, Geography, & Economics Lesson Plans** you used with your **3rd Grade Students** from the **Food, Land, and People (ASTE 6400)** curriculum for each subsequent year following having taken *Food, Land, and People*.

| Lesson Title | 2004-2005 Academic Year | 2005-2006 Academic Year | 2006-2007 Academic Year |
|---|---|---|---|
| Breads Around the World | | | |
| Building from the Ground Up | | | |
| By the Way | | | |
| Corn An Amazing Plant | | | |
| Find Your Way on the Farm | | | |
| From Fiber to Fashion | | | |
| Gala Fiesta Jamboree | | | |
| Let's Celebrate | | | |
| Look for Cocoa | | | |
| Powerful Potato | | | |

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|---|---|---|---|
| Root, Root for Life | | | |
| Seasons Through the Year | | | |
| Source Search | | | |
| Terrific Tubers | | | |
| The Peanut Wizard | | | |
| Tomatoes to Ketchup, Chickens to Omelettes | | | |
| What If? | | | |
| Who's Hungry | | | |
| Your School Ground Through New Eyes | | | |

10. Please check the box indicating which **Additional Activities** you used with your **3rd Grade Students** from the **Food, Land, and People (ASTE 6400)** curriculum for each subsequent year following having taken *Food, Land, and People*.

| Activity Title | 2004-2005 Academic Year | 2005-2006 Academic Year | 2006-2007 Academic Year |
|---|---|---|---|
| Agricultural Pop-ups | | | |
| Can You Hear Me Now? | | | |
| Clothing and Jewelry | | | |
| Earthworms on Parade | | | |
| Farming the Land | | | |
| Grow it Again | | | |
| Homes | | | |
| Indian Mound Farm | | | |
| Money Trees | | | |
| Nutrient Variable | | | |
| Oh, The Places You'll Go | | | |
| Site Map | | | |
| Snooty Fruit | | | |
| Snow Comes to the Farm | | | |
| The Garden Show | | | |
| The Numbers on the Bag | | | |

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|---|---|---|---|
| The Power of Choice | | | |
| The Turkeys Go on Strike | | | |
| Weather Harvest Game | | | |
| What is a Fruit? | | | |
| What is a Vegetable? | | | |
| When the Bees Fly Home | | | |
| Who Makes the Best Burger? | | | |

11. Please check the box indicating which **Healthy Lifestyles Lesson Plans** you used with your **4th Grade Students** from the **Food, Land, and People (ASTE 6400)** curriculum for each subsequent year following having taken *Food, Land, and People*.

| Lesson Title | 2004-2005 Academic Year | 2005-2006 Academic Year | 2006-2007 Academic Year |
|---|---|---|---|
| Calorie Countdown | | | |
| Food Math | | | |
| Food System Chain | | | |
| Food Systems Feed the World | | | |
| Hunger & Malnutrition | | | |
| Lunchtime Favorites | | | |
| Mighty Macros | | | |
| MyPyramid for Kids | | | |
| Understanding MyPyramid | | | |
| Vary Your Veggies and Focus on the Fruits | | | |
| What's the Shape of Your Diet? | | | |

12. Please check the box indicating which **Science Lesson Plans** you used with your **4th Grade Students** from the **Food, Land, and People (ASTE 6400)** curriculum for each subsequent year following having taken *Food, Land, and People*.

| Lesson Title | 2004-2005 Academic Year | 2005-2006 Academic Year | 2006-2007 Academic Year |
|---|---|---|---|
| Air Pressure and Wind | | | |
| Caring for the Land | | | |
| Case of the Missing Pumpkins | | | |
| Charting & Graphing Utah Weather | | | |
| Dark Days | | | |
| Don't Use It All Up! | | | |
| From Apple Cores to Healthy Soils | | | |
| Gravity and Layers of Air | | | |
| How Much is Dirt Worth? | | | |
| Investigating Insects | | | |
| Keeping Soil in its Place | | | |
| Look Out, Below | | | |
| Moist Air and Clouds | | | |
| Perc Through the Pores | | | |
| Perkin' Through the Pores | | | |
| Pizza Anyone? | | | |
| Potato Candle | | | |
| Predicting Storms and Weather | | | |
| Rain On | | | |
| Ride the Wild Leaf Cycle | | | |
| Secrets to Healthy Soil | | | |
| Soil In My Food Web | | | |
| Soil is Not Trivial | | | |
| Sunlight and Warm Air | | | |
| The Rotten Truth | | | |
| The Soil Chain | | | |
| Till We or Won't We | | | |

| | | | |
|---|---|---|---|
| Types by Texture | | | |
| Water Cycle Relay | | | |
| Water Supply | | | |
| What Land Works Best? | | | |
| What Makes Up Your Profile? | | | |
| What's In Soil? | | | |
| Working Worms | | | |

13. Please check the box indicating which **Social Studies, Geography, & Economics Lesson Plans** you used with your **4th Grade Students** from the **Food, Land, and People (ASTE 6400)** curriculum for each subsequent year following having taken *Food, Land, and People*.

| Lesson Title | 2004-2005 Academic Year | 2005-2006 Academic Year | 2006-2007 Academic Year |
|---|---|---|---|
| Barter Days | | | |
| Breads Around the World | | | |
| Capital for Cookies | | | |
| Career Quiz | | | |
| Everyone Up! | | | |
| From Fiber to Fashion | | | |
| From Salt Lake City to Singapore | | | |
| Go, Go H2O! | | | |
| Growing Money | | | |
| Label Language | | | |
| More Than One Grain of Rice | | | |
| Off to Work | | | |
| Seasons Through the Year | | | |
| Step by Step | | | |
| The Dairy Shoppe | | | |
| The Trading Game | | | |
| What Piece of the Pie? | | | |
| Why I Buy | | | |

14. Please check the box indicating which **Additional Activities** you used with your **4th Grade Students** from the **Food, Land, and People (ASTE 6400)** curriculum for each subsequent year following having taken *Food, Land, and People*.

| Activity Title | 2004-2005 Academic Year | 2005-2006 Academic Year | 2006-2007 Academic Year |
|---|---|---|---|
| A World of Recipes: China | | | |
| A World of Recipes: India | | | |
| A World of Recipes: Japan | | | |
| Agricultural Pop-ups | | | |
| American Kids in History: Pioneer Days | | | |
| Asia | | | |
| Asia Maps | | | |
| Because of Winn Dixie | | | |
| Can You Hear Me Now? | | | |
| Clothing and Jewelry | | | |
| Cloud Maker | | | |
| Garden Weather Station | | | |
| Global Soils Map Page 1 | | | |
| Global Soils Map Page 2 | | | |
| Homes | | | |
| Indian Mound Farm | | | |
| Laura Ingalls Wilder, Series of Books | | | |
| Oh, The Places You Will Go | | | |
| One Grain of Rice | | | |
| Photographs of Japanese Supermarket | | | |
| The Hungry Ocean | | | |
| The Lazy B | | | |
| The Power of Choice | | | |
| Weather Harvest Game | | | |
| Wheat Weaving Kit | | | |
| Who Makes the Best Burger? | | | |
| Xeriscape | | | |

15. Please check the box indicating which **Healthy Lifestyles Lesson Plans** you used with your **5th Grade Students** from the **Food, Land, and People (ASTE 6400)** curriculum for each subsequent year following having taken *Food, Land, and People*.

| Lesson Title | 2004-2005 Academic Year | 2005-2006 Academic Year | 2006-2007 Academic Year |
|---|---|---|---|
| Calorie Countdown | | | |
| Calorie Counting | | | |
| Caring For the Land | | | |
| Dark Days | | | |
| Don't Use It All Up! | | | |
| Eating Out and Eating In-Go Lean With Protein | | | |
| Food System Chain | | | |
| Food Systems Feed the World | | | |
| From Fiber to Fashion | | | |
| Get Your Calcium – Rich Foods | | | |
| Getting the Most Nutrition From Your Food | | | |
| Hunger & Malnutrition In Harmony | | | |
| Less Elbow Room | | | |
| Mighty Macros | | | |
| Nail by Nail, Board by Board | | | |
| Now You Have It, Now You Don't | | | |
| To Whom It May Concern: | | | |
| Trash Bashing | | | |
| Tree-Mendous | | | |
| Understanding MyPyramid | | | |
| What Will The Land Support | | | |

16. Please check the box indicating which **Science Lesson Plans** you used with your **5th Grade Students** from the **Food, Land, and People (ASTE 6400)** curriculum for each subsequent year following having taken *Food, Land, and People*.

| Lesson Title | 2004-2005 Academic Year | 2005-2006 Academic Year | 2006-2007 Academic Year |
|---|---|---|---|
| A Bugs Life | | | |
| Banking on Seeds | | | |
| Bird Buffet | | | |
| Buzzy, Buzzy Bee | | | |
| Comparing Apples and Onions | | | |
| Flower Power | | | |
| Inherited Plant Traits | | | |
| Investigating Insects | | | |
| Paint's Family Tree | | | |
| Potato Candle | | | |
| Rock, Paper, Scissors | | | |
| Specialized Structures and Environments | | | |
| The Living Corn Necklace | | | |
| We're into Pumpkins | | | |

17. Please check the box indicating which **Social Studies, Geography, & Economics Lesson Plans** you used with your **5th Grade Students** from the **Food, Land, and People (ASTE 6400)** curriculum for each subsequent year following having taken *Food, Land, and People*.

| Lesson Title | 2004-2005 Academic Year | 2005-2006 Academic Year | 2006-2007 Academic Year |
|---|---|---|---|
| At Home on the Range | | | |
| Banking on Seeds | | | |
| Breads Around The World | | | |
| Clothesline Sleuth | | | |
| Corn An A-maizing Plant | | | |
| Expression Connection | | | |
| From Bolls to Bolts | | | |
| From Fiber to Fashion | | | |

| | | | |
|---|---|---|---|
| From Sea to Shining Sea | | | |
| Gala Fiesta Jamboree | | | |
| Global Grapefruit | | | |
| Global Grocery Bags | | | |
| Just a Matter of Time | | | |
| King Cotton | | | |
| More Than One Grain of Rice | | | |
| Next Year's Seeds | | | |
| Soil is Not Trivial | | | |
| That Was Then, This Is Now | | | |
| Trading Favorites | | | |
| Your Schoolground Through New Eyes | | | |

18. Please check the box indicating which **Additional Activities** you used with your **5th Grade Students** from the **Food, Land, and People (ASTE 6400)** curriculum for each subsequent year following having taken *Food, Land, and People*.

| Activity Title | 2004-2005 Academic Year | 2005-2006 Academic Year | 2006-2007 Academic Year |
|---|---|---|---|
| 13 Colonies | | | |
| Agricultural Pop-ups | | | |
| American Kids in History: Colonial Days | | | |
| Backyard Buddies | | | |
| Because of Winn Dixie | | | |
| Can You Hear Me Now? | | | |
| Chew on This! | | | |
| Clothing and Jewelry | | | |
| Exploding Cactus | | | |
| Grow Cards | | | |
| Homes | | | |
| Insect Predictions and Surveys | | | |
| Insect Symmetry | | | |
| Irish Famine: The Birth of Irish America | | | |
| Key Ingredients, | | | |

| | | | |
|---|---|---|---|
| America by Foods | | | |
| Know & Show Sombrero | | | |
| Let's Try Organic | | | |
| Metamorphosis Bracelets and Belts | | | |
| Morpho Play | | | |
| Nature Class Web | | | |
| Nory Ryan's Song | | | |
| Oh, The Places You'll Go | | | |
| Planet Zorcon | | | |
| Revolutionary War Days | | | |
| Right Here On This Spot | | | |
| Secret Smells Game | | | |
| Spill the Beans and Pass the Peanuts | | | |
| Suck-A-Bug | | | |
| The Bartering System | | | |
| The Food Chain Gang | | | |
| The Food Timeline | | | |
| The Great Cover-up | | | |
| The Hungry Ocean | | | |
| The Lazy B | | | |
| The Power of Choice | | | |
| Vermi-Composting | | | |
| Weighting Wastes | | | |
| Wheat Weaving Kit | | | |
| When The Bees Fly Home | | | |
| Who Makes the Best Burger | | | |
| Xeriscape | | | |

19. Please check the box indicating which **Healthy Lifestyles Lesson Plans** you used with your **6th Grade Students** from the **Food, Land, and People (ASTE 6400)** curriculum for each subsequent year following having taken *Food, Land, and People*.

| Lesson Title | 2004-2005 Academic Year | 2005-2006 Academic Year | 2006-2007 Academic Year |
|---|---|---|---|
| Be Label Abel | | | |
| Calorie Counting | | | |
| Could It Be Something I Ate? | | | |
| Eating Out and Eating In- Go Lean With Protein | | | |
| Food System Chain | | | |
| Food Systems Feed the World | | | |
| Food…Can you Handle it? | | | |
| Germ Busters | | | |
| Get Your Calcium – Rich Foods | | | |
| Getting the Most Nutrition From Your Foods | | | |
| Hunger & Malnutrition | | | |
| In Harmony | | | |
| Less Elbow Room | | | |
| Mighty Macros | | | |
| Nail by Nail, Board by Board | | | |
| Now You Have It, Now You Don't | | | |
| To Whom It May Concern: | | | |
| Trash Bashing | | | |
| Tree-Mendous | | | |
| Understanding MyPyramid | | | |
| What Will the Land Support | | | |
| What's the Shape of Your Diet | | | |

20. Please check the box indicating which **Science Lesson Plans** you used with your **6th Grade Students** from the **Food, Land, and People (ASTE 6400)** curriculum for each subsequent year following having taken *Food, Land, and People*.

| Lesson Title | 2004-2005 Academic Year | 2005-2006 Academic Year | 2006-2007 Academic Year |
|---|---|---|---|
| Agriculture in Space | | | |
| Cheese Please | | | |
| Could it be Something I Ate? | | | |
| Food….Can You Handle It? | | | |
| Fool-Proof Yogurt | | | |
| Germ Busters | | | |
| Good Guys or Bad Guys | | | |
| Microbe Experimentation | | | |
| Microbes and Health | | | |
| Microorganism Multiplication | | | |
| Naked to the Eye | | | |
| Potato Candle | | | |
| Seasons through the Year | | | |

21. Please check the box indicating which **Social Studies, Geography, & Economics Lesson Plans** you used with your **6th Grade Students** from the **Food, Land, and People (ASTE 6400)** curriculum for each subsequent year following having taken *Food, Land, and People*.

| Lesson Title | 2004-2005 Academic Year | 2005-2006 Academic Year | 2006-2007 Academic Year |
|---|---|---|---|
| A Common Thread | | | |
| A Timeline of Mediterranean Civilizations | | | |
| Ancient Egypt | | | |
| Ancient Greece | | | |
| Ancient Rome | | | |
| Breads Around the World | | | |
| Clothesline Sleuth | | | |
| Egypt: Ancient and Endless | | | |
| European Agriculture | | | |
| From Foraging to Farming | | | |
| Global Grocery Bags | | | |
| Go, Go H2O! | | | |
| Hunters & Gatherers | | | |
| More Than One Grain of Rice | | | |
| Next Year's Seeds | | | |

22. Please check the box indicating which **Additional Activities** you used with your **6th Grade Students** from the **Food, Land, and People (ASTE 6400)** curriculum for each subsequent year following having taken *Food, Land, and People*.

| Activity Title | 2004-2005 Academic Year | 2005-2006 Academic Year | 2006-2007 Academic Year |
|---|---|---|---|
| Agricultural Pop-ups | | | |
| Backyard Buddy | | | |
| Because of Winn Dixie | | | |
| Bread - Media | | | |
| Bread-in-a Bag | | | |
| Browing in Apples | | | |
| Cheese Please | | | |
| Clothing and Jewelry | | | |
| Compost Sandwich Composition | | | |
| Composting Critter Page | | | |
| Disease Caused By Microorganisms | | | |
| European Population, Geography, Natural Resources & Agricultural Map | | | |
| Exploratory Fungi | | | |
| Food Preservation Techniques | | | |
| Food Safety | | | |
| Fool-Proof Yogurt | | | |
| Germ Busting and Dusting | | | |
| Grow an Apple Fungus | | | |
| Grow Cards | | | |
| Growing Up in Ancient Egypt | | | |
| Growing Up in Ancient Rome | | | |
| Homes | | | |
| Key Ingredients, America by Foods | | | |
| Label Reader | | | |
| Lacey Leaves | | | |

| | | | |
|---|---|---|---|
| Let's Try Organic | | | |
| Likin' those Lichens | | | |
| Mini-Movies on Microorganisms | | | |
| Oh, The Places You'll Go | | | |
| One Bad Apple Spoils the Bunch | | | |
| Planet Zorcon | | | |
| Pond Life | | | |
| Potato Petri Dish | | | |
| Refrigerator Growth | | | |
| Rennet-Cultured and Biotech Cheese | | | |
| Rotten Truth | | | |
| Science In Your Shopping Cart | | | |
| Show them the Germs | | | |
| Sour Milk | | | |
| Spore Drops | | | |
| Spud Smear | | | |
| Stomach Microorganisms | | | |
| The Food Chain Gang | | | |
| The Food Timeline | | | |
| The Hungry Ocean | | | |
| The Lazy B | | | |
| The Power of Choice | | | |
| The Unwelcome Dinner Guest | | | |
| Vermi-Composting | | | |
| Weighing Wastes | | | |
| Wheat Kit | | | |
| Wheat Weaving Activity | | | |
| Who Makes the Best Burger? | | | |
| Xeriscape | | | |
| Yeast Blowup | | | |
| Yeast Bread | | | |
| You're Aboard Spaceship Earth | | | |

# Appendix D

## Lessons and Activities Used by Food, Land, and People Participants

| **PreK-Kindergarten Lessons and Activities Used** | Number of Times Used |
|---|---|
| How a Seed Grows And Who Grows it? | 25 |
| Favorite Foods | 17 |
| Need to Eat 5 A Day | 17 |
| The Little Red Hen | 17 |
| Pumpkin, Pumpkin | 14 |
| Seasons Through the Year | 14 |
| Animal Names | 13 |
| Four Seasons | 13 |
| Chicken and Egg | 12 |
| Where Do They Grow | 11 |
| Where Is Agriculture? | 11 |
| What's Your Favorite Season | 10 |
| K-2 Core Connections | 9 |
| Outdoor Observation | 9 |
| Animal Facts | 8 |
| Chickens | 8 |
| Colors on the Farm | 8 |
| Fruity Counters | 8 |
| Time to Wash Hands | 8 |
| Vegetable Twister | 8 |
| Cattle | 7 |
| Color, Cut, and Paste | 7 |
| Exploding Cheeseburger | 7 |
| F and Vs Are Different | 7 |
| Lunchtime Favorites | 7 |
| New F's and V's I Tried | 7 |
| Tasting new F's and V's | 7 |
| Baby Lamb | 5 |
| Better Butter | 5 |
| Homes | 5 |
| School Ground Caretakers | 5 |
| Those Amazing Earthworms | 5 |
| Agricultural Pop-ups | 3 |
| Greedy Cat's Breakfast | 3 |
| Sheep | 3 |
| Too Many Tamales | 3 |
| I Can Make a Difference | 2 |
| About Books | 1 |
| The Texture of Timber | 1 |
| Who Makes the Best Burger? | 1 |
| Count Your Way Through Mexico | 0 |
| Earthworms on Parade | 0 |
| I know the Difference | 0 |
| One Fine Day | 0 |
| Ostriches | 0 |
| Sheep Crossing | 0 |

| | |
|---|---|
| Three Cheers for Catherine the Great | 0 |
| Vacation Matrix | 0 |
| Who's Who | 0 |

## 1st Grade Lessons and Activities Used

| | |
|---|---|
| How a Seed Grows And Who Grows it? | 22 |
| Seasons Through the Year | 19 |
| My Little Seed House | 17 |
| Fruits and Veggies | 15 |
| Pumpkin, Pumpkin | 14 |
| Need to Eat 5 A Day | 12 |
| Buzzy, Buzzy Bee | 11 |
| How Does Your Garden Grow? | 11 |
| The Little Red Hen | 11 |
| Better Butter | 10 |
| Egg Maze: Counting by Twos, Threes and Fives | 10 |
| P.L.A.N.T. Needs | 10 |
| Time to Wash Hands | 10 |
| Where Is Agriculture? | 10 |
| Agriculture Counts | 9 |
| Chewsy Choices | 9 |
| Hamburger Plant | 9 |
| Nuts About Peanuts | 9 |
| Plants Love Air | 9 |
| Animal Facts | 8 |
| The Great Pumpkin | 8 |
| Breads Around the World | 7 |
| Exploding Cheeseburger | 7 |
| Weaving Wool | 7 |
| Agricultural Pop-ups | 6 |
| Australian Resources | 6 |
| Countries, Food and Culture | 6 |
| F and V Bingo | 5 |
| Leaf-and-Seed-Sort Information Chart | 5 |
| Pizza Time Bulletin Board | 5 |

## 2nd Grade Lessons and Activities Used

| | |
|---|---|
| Eat Smart With My Pyramid for Kids | 16 |
| Pumpkin, Pumpkin | 10 |
| Color Your Plate | 8 |
| Tomatoes to Ketchup, Chickens to Omelettes | 7 |
| Agriculture Counts | 6 |
| Animal Facts | 5 |
| Build a Burger | 5 |
| Seasons Through the Year | 5 |
| Time to Wash Hands | 5 |
| Egg Maze: Counting by Twos, Threes and Fives | 4 |

| | |
|---|---|
| Source Search | 4 |
| Countries, Food and Culture | 3 |
| Mr. Bumble | 3 |
| Nuts About Peanuts | 3 |
| The Garden Show | 3 |
| What is a Fruit? | 3 |
| What is a Vegetable? | 3 |
| Agricultural Pop-ups | 2 |
| Breads Around the World | 2 |
| Chewsy Choices | 2 |
| Mali, Africa, and Agriculture | 2 |
| Mystery F and V's | 2 |
| Oh, The Places You'll Go | 2 |
| Peanut Butter and | 2 |
| Those Amazing Earthworms | 2 |
| A Day Without Agriculture | 1 |
| Ag Pays | 1 |
| Agricultural ABC's | 1 |
| Buzzy, Buzzy Bee | 1 |
| Fainting Goats | 1 |
| In the Good Old Days | 1 |
| K-2 Core Connections | 1 |
| Peanut Plant Kit | 1 |
| Ready, Set, Plant | 1 |
| The Little Red Hen | 1 |
| When the Bees Fly Home | 1 |
| Who Needs Agriculture? | 1 |
| Who's Hungry | 1 |
| F and V Bingo | 0 |
| By the Way | 0 |
| Earthworms on Parade | 0 |
| Food Distribution and Preservation | 0 |
| Gala Fiesta Jamboree | 0 |
| I Can Make a Difference | 0 |
| Lunchtime Favorites | 0 |
| New F's and V's I Tried | 0 |
| School Ground Caretakers | 0 |
| Sheep Crossing | 0 |
| Snooty Fruit | 0 |
| Snow Comes to the Farm | 0 |
| The Little Red Hen | 0 |
| The Turkeys Go on Strike | 0 |
| Tools of the Time | 0 |
| Understanding MyPyramid | 0 |
| Vary Your Veggies and Focus on Fruit | 0 |
| Vegetable Twister | 0 |
| Visits with a Vet | 0 |
| Weather Harvest Game | 0 |

| | |
|---|---|
| What Does Ag Have to Do With Me? | 0 |
| Who Makes the Best Burger? | 0 |
| Why are People Hungry? | 0 |
| You're Aboard Spaceship Earth | 0 |

## 3rd Grade Lessons and Activities Used

| | |
|---|---|
| Made to Move:  Simple Machines | 9 |
| Understanding MyPyramid | 9 |
| Breads Around the World | 7 |
| Chewsy Choices | 7 |
| Does Your Diet Stack Up? | 6 |
| Find Your Way on the Farm | 6 |
| Corn An Amazing Plant | 5 |
| Food Math | 5 |
| Lunchtime Favorites | 5 |
| MyPyramid for Kids | 5 |
| The Peanut Wizard | 5 |
| Gravity and Layers of Air | 4 |
| Look for Cocoa | 4 |
| Vegetable Twister | 4 |
| When the Bees Fly Home | 4 |
| Why are People Hungry? | 4 |
| Agricultural Pop-ups | 3 |
| Big Tree, Little Tree | 3 |
| Farming the Land | 3 |
| From Fiber to Fashion | 3 |
| Money Trees | 3 |
| Sunlight and Warm Air | 3 |
| Terrific Tubers | 3 |
| Those Amazing Earthworms | 3 |
| What's the Shape of Your Diet? | 3 |
| By the Way | 2 |
| Grow it Again | 2 |
| Let's Celebrate | 2 |
| Powerful Potato | 2 |
| Root, Root for Life | 2 |
| Snooty Fruit | 2 |
| Tomatoes to Ketchup, Chickens to Omelettes | 2 |
| What is a Fruit? | 2 |
| What is a Vegetable? | 2 |
| Who Makes the Best Burger? | 2 |
| Who's Hungry | 2 |
| Clothing and Jewelry | 1 |
| Building from the Ground Up | 1 |
| Can You Hear Me Now? | 1 |
| Homes | 1 |
| Indian Mound Farm | 1 |

| | |
|---|---|
| Oh, The Places You'll Go | 1 |
| Profit From Pumpkins | 1 |
| Seasons Through the Year | 1 |
| Snow Comes to the Farm | 1 |
| Terrariums | 1 |
| The Turkeys Go on Strike | 1 |
| A Worm's World | 0 |
| Earthworms on Parade | 0 |
| Gala Fiesta Jamboree | 0 |
| Nutrient Variable | 0 |
| Potato Candle | 0 |
| Site Map | 0 |
| Source Search | 0 |
| The Garden Show | 0 |
| The Numbers on the Bag | 0 |
| The Power of Choice | 0 |
| Vary Your Veggies and Focus on Fruit | 0 |
| Weather Harvest Game | 0 |
| What If? | 0 |
| Who's Hungry | 0 |
| Your School Ground Through New Eyes | 0 |

## 4th Grade Lessons and Activities Used

| | |
|---|---|
| How Much is Dirt Worth? | 25 |
| Charting and Graphing Utah Weather | 23 |
| Keeping Soil in its Place | 19 |
| What's In Soil? | 19 |
| Cloud Maker | 18 |
| Secrets to Healthy Soil | 18 |
| Air Pressure and Wind | 16 |
| American Kids in History: Pioneer Days | 14 |
| Lunchtime Favorites | 14 |
| MyPyramid for Kids | 14 |
| Food Math | 13 |
| Food System Chain | 13 |
| Go, Go H2O! | 13 |
| Soil In My Food Web | 13 |
| Soil is Not Trivial | 13 |
| The Soil Chain | 12 |
| What Makes Up Your Profile? | 12 |
| From Fiber to Fashion | 11 |
| Predicting Storms and Weather | 11 |
| Water Cycle Relay | 11 |
| Caring for the Land | 10 |
| One Grain of Rice | 10 |
| Understanding MyPyramid | 10 |
| A World of Recipes: Japan | 9 |

| | |
|---|---|
| Breads Around the World | 9 |
| Don’t Use It All Up! | 9 |
| From Apple Cores to Healthy Soils | 9 |
| Water Supply | 9 |
| Global Soils Map Page 1 | 8 |
| Moist Air and Clouds | 8 |
| More Than One Grain of Rice | 8 |
| What Land Works Best? | 8 |
| What’s the Shape of Your Diet? | 8 |
| Calorie Countdown | 7 |
| Rain On | 7 |
| What Piece of the Pie? | 7 |
| Capital for Cookies | 6 |
| Dark Days | 6 |
| Photographs of Japanese Supermarket | 6 |
| Career Quiz | 5 |
| Global Soils Map Page 2 | 5 |
| The Dairy Shoppe | 5 |
| Why I Buy | 5 |
| A World of Recipes: China | 4 |
| Barter Days | 4 |
| Case of the Missing Pumpkins | 4 |
| Food Systems Feed the World | 4 |
| Investigating Insects | 4 |
| Look Out, Below | 4 |
| The Power of Choice | 4 |
| Vary Your Veggies and Focus on Fruit | 4 |
| Pizza Anyone? | 3 |
| The Trading Game | 3 |
| Types by Texture | 3 |
| Weather Harvest Game | 3 |
| Working Worms | 3 |
| From Salt Lake City to Singapore | 2 |
| Gravity and Layers of Air | 2 |
| Hunger and Malnutrition | 2 |
| Label Language | 2 |
| Mighty Macros | 2 |
| Perkin’ Through the Pores | 2 |
| Seasons Through the Year | 2 |
| Xeriscape | 2 |
| A World of Recipes: India | 1 |
| Asia | 1 |
| Asia Maps | 1 |
| Garden Weather Station | 1 |
| Growing Money | 1 |
| Indian Mound Farm | 1 |
| Off to Work | 1 |
| Ride the Wild Leaf Cycle | 1 |

| | |
|---|---|
| Sunlight and Warm Air | 1 |
| The Rotten Truth | 1 |
| Clothing and Jewelry | 0 |
| Agricultural Pop-ups | 0 |
| Because of Winn Dixie | 0 |
| Can You Hear Me Now? | 0 |
| Everyone Up! | 0 |
| Homes | 0 |
| Laura Ingalls Wilder, Series of Books | 0 |
| Oh, The Places You'll Go | 0 |
| Perkin' Through the Pores | 0 |
| Potato Candle | 0 |
| Step by Step | 0 |
| The Hungry Ocean | 0 |
| The Lazy B | 0 |
| Till We or Won't We | 0 |
| Wheat Weaving Kit | 0 |
| Who Makes the Best Burger? | 0 |

## 5th Grade Lessons and Activities Used

| | |
|---|---|
| Paint's Family Tree | 27 |
| Inherited Plant Traits | 24 |
| Rock, Paper, Scissors | 24 |
| From Bolls to Bolts | 23 |
| Bird Buffet | 20 |
| Specialized Structures and Environments | 18 |
| Flower Power | 17 |
| The Living Corn Necklace | 15 |
| Comparing Apples and Onions | 13 |
| A Bugs Life | 12 |
| Buzzy, Buzzy Bee | 11 |
| From Sea to Shining Sea | 11 |
| From Fiber to Fashion | 10 |
| Investigating Insects | 10 |
| Understanding MyPyramid | 10 |
| American Kids in History: Colonial Days | 9 |
| From Fiber to Fashion | 9 |
| At Home on the Range | 8 |
| Banking on Seeds | 8 |
| Calorie Counting | 8 |
| Corn An Amazing Plant | 8 |
| Don't Use It All Up! | 8 |
| Food System Chain | 8 |
| 13 Colonies | 7 |
| Caring for the Land | 7 |
| Food Systems Feed the World | 7 |
| Getting the Most Nutrition From Your Food | 7 |

| | |
|---|---|
| What Will the Land Support | 7 |
| Clothesline Sleuth | 6 |
| Eating Out and Eating In - Go Lean With Protein | 6 |
| King Cotton | 6 |
| Now You Have It, Now You Don't | 6 |
| Revolutionary War Days | 6 |
| Gala Fiesta Jamboree | 5 |
| Get Your Calcium Rich Foods | 5 |
| To Whom It May Concern: | 5 |
| Backyard Buddies | 4 |
| Banking on Seeds | 4 |
| Calorie Countdown | 4 |
| Dark Days | 4 |
| Hunger and Malnutrition In Harmony | 4 |
| Insect Symmetry | 4 |
| Potato Candle | 4 |
| Soil is Not Trivial | 4 |
| Suck-A-Bug | 4 |
| Agricultural Pop-ups | 3 |
| Breads Around the World | 3 |
| Can You Hear Me Now? | 3 |
| Exploding Cactus | 3 |
| Insect Predictions and Surveys | 3 |
| Just a Matter of Time | 3 |
| Next Year's Seeds | 3 |
| Oh, The Places You'll Go | 3 |
| Trading Favorites | 3 |
| Tree-Mendous | 3 |
| Weighing Wastes | 2 |
| Expression Connection | 2 |
| Know and Show Sombrero | 2 |
| Secret Smells Game | 2 |
| The Bartering System | 2 |
| The Food Timeline | 2 |
| The Great Cover-up | 2 |
| We're into Pumpkins | 2 |
| Your School Ground Through New Eyes | 2 |
| Clothing and Jewelry | 1 |
| Chew on This! | 1 |
| Global Grapefruit | 1 |
| Global Grocery Bags | 1 |
| Grow Cards | 1 |
| Homes | 1 |
| Key Ingredients, America by Foods | 1 |
| Less Elbow Room | 1 |
| Nory Ryan's Song | 1 |
| Spill the Beans and Pass the Peanuts | 1 |
| That Was Then, This Is Now | 1 |

| | |
|---|---|
| Trash Bashing | 1 |
| Weighting Wastes | 1 |
| Wheat Weaving Kit | 1 |
| Irish Famine: The Birth of Irish America | 0 |
| Let's Try Organic | 0 |
| Metamorphosis Bracelets and Belts | 0 |
| Mighty Macros | 0 |
| More Than One Grain of Rice | 0 |
| Morpho Play | 0 |
| Nail by Nail, Board by Board | 0 |
| Nature Class Web | 0 |
| Planet Zorcon | 0 |
| Right Here On This Spot | 0 |
| The Food Chain Gang | 0 |
| The Hungry Ocean | 0 |
| The Lazy B | 0 |
| The Power of Choice | 0 |
| Vermi-Composting | 0 |
| When the Bees Fly Home | 0 |
| Who Makes the Best Burger? | 0 |
| Xeriscape | 0 |

## 6th Grade Lessons and Activities Used

| | |
|---|---|
| Ancient Egypt | 15 |
| Calorie Counting | 14 |
| Ancient Greece | 13 |
| Fool-Proof Yogurt | 13 |
| Microorganism Multiplication | 13 |
| Breads Around the World | 12 |
| Ancient Rome | 11 |
| Germ Busters | 11 |
| Good Guys or Bad Guys | 11 |
| Mighty Macros | 11 |
| Understanding MyPyramid | 11 |
| Yeast Blowup | 11 |
| Browing in Apples | 10 |
| Fool-Proof Yogurt | 10 |
| Germ Busters | 10 |
| Bread-in-a-Bag | 9 |
| Compost Sandwich Composition | 9 |
| Microbe Experimentation | 9 |
| Yeast Bread | 9 |
| Bread – Media | 8 |
| Cheese Please | 8 |
| Microbes and Health | 8 |
| Potato Petri Dish | 8 |
| Wheat Kit | 8 |

| | |
|---|---|
| Cheese Please | 7 |
| Could It Be Something I Ate? | 7 |
| Food: Can You Handle It? | 7 |
| A Timeline of Mediterranean Civilizations | 6 |
| Disease Caused By Microorganisms | 6 |
| Food Preservation Techniques | 6 |
| Food Safety | 6 |
| Pond Life | 6 |
| Rennet-Cultured and Biotech Cheese | 6 |
| Could It Be Something I Ate? | 5 |
| Egypt:  Ancient and Endless | 5 |
| Exploratory Fungi | 5 |
| Food System Chain | 5 |
| Food Systems Feed the World | 5 |
| Global Grocery Bags | 5 |
| Go, Go H2O! | 5 |
| Label Reader | 5 |
| Refrigerator Growth | 5 |
| What Will the Land Support | 5 |
| Agriculture in Space | 4 |
| Clothesline Sleuth | 4 |
| Grow an Apple Fungus | 4 |
| More Than One Grain of Rice | 4 |
| Stomach Microorganisms | 4 |
| Be Label Abel | 3 |
| European Agriculture | 3 |
| Germ Busting and Dusting | 3 |
| Get Your Calcium Rich Foods | 3 |
| Getting the Most Nutrition From Your Food | 3 |
| Growing Up in Ancient Egypt | 3 |
| Eating Out and Eating In - Go Lean With Protein | 2 |
| Growing Up in Ancient Rome | 2 |
| Now You Have It, Now You Don’t | 2 |
| One Bad Apple Spoils the Bunch | 2 |
| Show them the Germs | 2 |
| Sour Milk | 2 |
| Clothing and Jewelry | 1 |
| Because of Winn Dixie | 1 |
| Food: Can You Handle It? | 1 |
| Homes | 1 |
| Nail by Nail, Board by Board | 1 |
| Seasons Through the Year | 1 |
| Spore Drops | 1 |
| A Common Thread | 0 |
| Agricultural Pop-ups | 0 |
| Backyard Buddies | 0 |
| Weighing Wastes | 0 |
| Composting Critter Page | 0 |

| | |
|---|---|
| European Population, Geography, Natural Resources and Agricultural Map | 0 |
| From Foraging to Farming | 0 |
| Grow Cards | 0 |
| Hunger and Malnutrition | 0 |
| Hunters and Gatherers | 0 |
| In Harmony | 0 |
| Key Ingredients, America by Foods | 0 |
| Lacey Leaves | 0 |
| Less Elbow Room | 0 |
| Let’s Try Organic | 0 |
| Likin’ those Lichens | 0 |
| Mini-Movies on Microorganisms | 0 |
| Naked to the Eye | 0 |
| Next Year’s Seeds | 0 |
| Oh, The Places You’ll Go | 0 |
| Planet Zorcon | 0 |
| Potato Candle | 0 |
| Rotten Truth | 0 |
| Science In Your Shopping Cart | 0 |
| Spud Smear | 0 |
| The Food Chain Gang | 0 |
| The Food Timeline | 0 |
| The Hungry Ocean | 0 |
| The Lazy B | 0 |
| The Power of Choice | 0 |
| The Unwelcome Dinner Guest | 0 |
| To Whom It May Concern: | 0 |
| Trash Bashing | 0 |
| Tree-Mendous | 0 |
| Vermi-Composting | 0 |
| What’s the Shape of Your Diet? | 0 |
| Wheat Weaving Activity | 0 |
| Who Makes the Best Burger? | 0 |
| Xeriscape | 0 |
| You’re Aboard Spaceship Earth | 0 |

# Appendix E

## Emailed Presurvey Letter

Dear Participant,

I am conducting a study on teacher professional development programs and am in need of your input. Within the week you will receive another email from me containing an electronic link and password to take a short survey. Will you please take 5 minutes to complete the survey? The survey results will be used to help better understand the effectiveness of teacher professional development programs?

As part of the study, I am looking at course content from Utah State University's *Food, Land, and People* (ASTE 6400). You have been chosen to participate because Utah State University records indicate that you took *Food, Land, and People* (ASTE 6400).

Results of this survey will be used to help design teacher professional development programs to make them more effective. Your participation will add to our understanding of effective professional development programs.

Your answers will be kept completely confidential. Data collected will not be associated with you personally; rather it will be sorted and analyzed in conjunction with other participant responses. Your participation is voluntary. However, your participation will be greatly appreciated and will help this research study.

As a token of my appreciation for completing the survey, you will be entered into a drawing to receive some complimentary books from the Utah Agriculture in the Classroom program.

If you have any questions or comments about this study please call me at (435) 797-2220 or email me at clay.rasmussen@usu.edu.

Thank you very much for helping in this important study.

Sincerely,

Clay Rasmussen

# Appendix F

## 2nd Email Message

Dear Participant,

I previously sent you an email notifying you of an important study being conducted on teacher professional development programs. I need to collect this data so that I can graduate this spring. I hope you will now take a moment to complete this short survey. It should take about 5 minutes or less to complete.

The survey can be accessed by clicking the link (if you are not taken directly to the site copy and paste the address into a browser window). The first page is a welcome page, letting you know you are in the correct place and will ask for a user name and password. Your user name and password are case sensitive.

**Survey Link:** http://starbuck.bus.usu.edu/Survey/

**Your user name is:**
**Your password is:**

As part of the study, I am looking at course content from Utah State University's *Food, Land, and People* (ASTE 6400). You have been chosen to participate because Utah State University records indicate that you took *Food, Land, and People* (ASTE 6400) during the 2005-2006 academic year.

This survey is being used to help us better understand the effectiveness of teacher professional development programs. Your answers will be kept **completely confidential**. Data collected will not be associated with you personally; rather it will be sorted and analyzed in conjunction with other participant responses. Your participation is voluntary; however your participation will be greatly appreciated and will help this research study.

Results of this survey will be used to help design teacher professional development programs to make them more effective. Your participation will add to our understanding of effective professional development programs.

As a token of my appreciation for completing the survey, you will be entered into a drawing to receive some complimentary books from the Utah Agriculture in the Classroom program.

If you have any questions or comments about this study please call me at (435) 797-2220 or email me at clay.rasmussen@usu.edu.

Thank you very much for helping in this important study.

Sincerely,

Clay Rasmussen

# Appendix G

## 3rd Email Message

Dear Participant,

I hope you had a great holiday and break from school. I previously sent you an email notifying you of an important study being conducted on teacher professional development programs. I recognize that starting a new semester is very time consuming and often hectic, but I hope you will now take the time to complete this short survey. It should take about 5 minutes or less to complete.

The survey can be accessed by clicking the link (if you are not taken directly to the site copy and paste the address into a browser window). The first page is a welcome page, letting you know you are in the correct place and will ask for a user name and password. Your user name and password are case sensitive. It is often best to copy and paste your user name and password into the appropriate locations. Additionally you must click the Login Button; it will **NOT** work if you just press Enter.

**Survey Link:** http://starbuck.bus.usu.edu/Survey/

**Your user name is:**
**Your password is:**

As part of the study, I am looking at course content from Utah State University's *Food, Land, and People* (ASTE 6400). You have been chosen to participate because Utah State University records indicate that you took *Food, Land, and People* (ASTE 6400) during the 2005-2006 academic year.

This survey is being used to help us better understand the effectiveness of teacher professional development programs. Your answers will be kept **completely confidential**. Data collected will not be associated with you personally; rather it will be sorted and analyzed in conjunction with other participant responses. Your participation is voluntary; however your participation will be greatly appreciated and will help this research study.

Results of this survey will be used to help design teacher professional development programs to make them more effective. Your participation will add to our understanding of effective professional development programs.

As a token of my appreciation for completing the survey, you will be entered into a drawing to receive some complimentary books from the Utah Agriculture in the Classroom program.

If you have any questions or comments about this study please call me at (435) 213-6742 or email me at clay.rasmussen@usu.edu.

Thank you very much for helping in this important study.

Sincerely,
Clay Rasmussen

# Appendix H

## 4th Email Message

Dear Participant,

I recognize that your time is very valuable and precious. If you are like others, you carefully select the activities you participate in each day ensuring your time is spent wisely and productively. If you would take five minutes to complete my survey on teacher professional development it would really help me out. I need this completed so I can analyze the results of the study and write them up in order to graduate this spring.

The survey can be accessed by clicking the link (if you are not taken directly to the site copy and paste the address into a browser window). The first page is a welcome page, letting you know you are in the correct place and will ask for a user name and password. Your user name and password are case sensitive. It is often best to **copy and paste** your user name and password into the appropriate locations. Additionally you must click the Login Button; it will **NOT** work if you just press Enter.

**Survey Link:** http://starbuck.bus.usu.edu/Survey/

**Your user name is:**
**Your password is:**

As part of the study, I am looking at course content from Utah State University's *Food, Land, and People* (ASTE 6400). You have been chosen to participate because Utah State University records indicate that you took *Food, Land, and People* (ASTE 6400) during the 2005-2006 academic year.

This survey is being used to help us better understand the effectiveness of teacher professional development programs. Your answers will be kept **completely confidential**. Data collected will not be associated with you personally; rather it will be sorted and analyzed in conjunction with other participant responses. Your participation is voluntary; however your participation will be greatly appreciated and will help this research study.

Results of this survey will be used to help design teacher professional development programs to make them more effective. Your participation will add to our understanding of effective professional development programs.

As a token of my appreciation for completing the survey, you will be entered into a drawing to receive some complimentary books from the Utah Agriculture in the Classroom program.

If you have any questions or comments about this study please call me at (435) 213-6742 or email me at clay.rasmussen@usu.edu.

Thank you very much for helping in this important study.

Sincerely,
Clay Rasmussen

# Appendix I

## 5th Email Message

Dear Participant,

I apologize for taking up a moment of your time and filling your inbox with unsolicited emails. I normally would not intrude in this manner, but I am in need of your participation. Will you please take five minutes to complete the teacher professional development survey at this time? If you have already completed the survey I express my utmost thanks.

The survey can be accessed by clicking the link (if you are not taken directly to the site copy and paste the address into a browser window). The first page is a welcome page, letting you know you are in the correct place and will ask for a user name and password. Your user name and password are case sensitive. It is often best to **copy and paste** your user name and password into the appropriate locations. Additionally you must click the Login Button; it will **NOT** work if you just press Enter.

**Survey Link:** http://starbuck.bus.usu.edu/Survey/

**Your user name is:**
**Your password is:**

As part of the study, I am looking at course content from Utah State University's *Food, Land, and People* (ASTE 6400). You have been chosen to participate because Utah State University records indicate that you took *Food, Land, and People* (ASTE 6400) during the 2005-2006 academic year.

This survey is being used to help us better understand the effectiveness of teacher professional development programs. Your answers will be kept **completely confidential**. Data collected will not be associated with you personally; rather it will be sorted and analyzed in conjunction with other participant responses. Your participation is voluntary; however your participation will be greatly appreciated and will help this research study.

Results of this survey will be used to help design teacher professional development programs to make them more effective. Your participation will add to our understanding of effective professional development programs.

As a token of my appreciation for completing the survey, you will be entered into a drawing to receive some complimentary books from the Utah Agriculture in the Classroom program.

If you have any questions or comments about this study please call me at (435) 213-6742 or email me at clay.rasmussen@usu.edu.

Thank you very much for helping in this important study.

Sincerely,
Clay Rasmussen

# CURRICULUM VITAE

CLAY L RASMUSSEN

## EDUCATION

Ph.D. Curriculum & Instruction, Utah State University. May 2008.

Emphasis: Science Education
Concentration: Agriculture Education.

Dissertation: "A Causal-Comparative Model for the Examination of an Online Teacher Professional Development Program for an Elementary Agricultural Literacy Curriculum"

Advisor**:** Dr. Rebecca Monhardt

Committee: Dr. Brian Warnick, Dr. Rudy Tarpley, Dr. Gary Straquadine, and Dr. Bruce Miller

M.Ed. Educational Technology, Northern Arizona University. 2005

Major: Educational Technology

B.S. Agriculture, University of Arizona. 2000

Major: Agricultural Education

A.A.S. Animal Science, Brigham Young University Idaho (Formerly Ricks College). 1996

## CERTIFICATIONS

ARIZONA

Standard Secondary Teaching Certificate
Endorsements: General Agriculture, General Science, and Biology

Standard Vocational Agriculture
Endorsements: Agriculture

## TEACHING EXPERIENCES

### COURSES TAUGHT

- **Science, Technology, and Modern Society (**ASTE/ETE 3440). Utah State University. Fall 2006, Spring 2007, Summer 2007 (Satellite Class), Fall 2007, Spring 2008.

  Designed to challenge students from all academic majors to develop an understanding of the dynamic interaction between science, technology, and society. Explores responsibility of humans for directing the utilization of technology as a creative enterprise. Also taught as ETE 3440. (3.000 Credit Hours)

- **Cognition and Evaluation of Student Learning** (SCED 4210). Utah State University. Spring 2007. (Taught second half of semester when professor had surgery.)

  Designed to lead the pre-service secondary school teacher to address two questions: (1) How do students construct concepts; discover relationships; and develop knowledge-level skills, comprehension and communication skills, and problem-solving abilities? (2) How do teachers monitor students, progress, evaluate and communicate their achievement, and interpret the results of system-wide and standardized test results to students and their parents? (3 Credit Hours)

- **Science Clinical Experience 1 (**SCED 3300). Utah State University. Spring 2006.

  First clinical practicum (40 hours minimum) in middle and secondary schools, arranged by special methods instructors in department. (1 Credit Hour)

- **Science Clinical Experience 2** (SCED 4300). Utah State University. Spring 2006.

  Second clinical practicum (40 hours minimum) in middle and secondary schools, arranged by special methods instructors in department. (1 Credit Hour)

### RELATED EXPERIENCE

**Utah State University. 2005 – Present.**

- **Graduate Assistant** – Research and teaching assistant.
- **Student Teacher Supervisor** - Supervised and evaluated student teachers of

Science, Social Studies, and History in the 6-12 classrooms.

- **Science Methods Teaching Aide** - Assisted with all aspects of secondary science methods including teaching and supervising.

**K-12 PROFFESSIONAL EXPERIENCE**

- **Willcox Middle School, Willcox, Arizona. 2003 – 2005.**
  Teacher: Grade 7

  - Taught Life Science Classes to all 7th grade students.
  - Organized and held annual science fair for entire middle school.
  - Assistant wrestling coach.
  - Provided in-service training on use of Electronic Gradebook.

- **Pima Unified School District, Pima, Arizona. 2002-2003.**
  Alternative School Teacher: Grades 6, 7, 8 & 9.

  - Taught students in math, reading, writing, social studies, and science.
  - Assistant wrestling coach.
  - Supervised after school detention.

- **Canyon State Academy, Queen Creek, Arizona. 2001-2002.**
  Teacher: Grades 6, 7, 8, & 9.

  - Taught at risk boy. Students were sent to this school by parole officers, judges, and child protective services.
  - Taught Life Science
  - Taught Agricultural Education
  - Trained students in animal care and horseback riding.

- **St. David High School, St. David, Arizona. Spring 2000.**
  Student Teacher: Grades 6-12.

  - Taught vocational agricultural classes including: Weeds, Entomology, Home Gardening, Plumbing, Electricity, Electric Motors, Cold Metal, Surveying, Concrete, Masonry, and Small Gas Engines.
  - Supervise and assist students with their Supervised Agricultural Experiences (SAE).
  - Advised and trained students for FFA contests.

## ADDITIONAL PROFFESSIONAL EXPERIENCES

- **IBP Inc., Storm Lake Iowa. 2000-2001**
  Pork Procurement Specialist.

    - Contracted with producers on purchasing market hogs using future markets and contracts.

## PROFFESSIONAL MEMBERSHIP

- National Science Teacher Association
- North American Colleges and Teachers of Agriculture
- Northern Rocky Mountain Educational Research Association

## PUBLICATIONS

Rasmussen, C., Resler, A., & Rasmussen, A. (2008). Tried and True: Cell City Webquest. *Science Scope*, 31(5), 12-14.

Rasmussen, C., Warnick, B., & Miller, R. (In Press). Using a General Education Life Science Course to Teach Agriculture: Changing Student Perceptions.

Rasmussen, C., Sullivan, K. (In Preparation). Women in science: undergraduate academic barriers.

## PROFFESSIONAL PRESENTATIONS

### National

Rasmussen, C., Warnick, B., & Miller, R. (2007, June.) *Changes in student perceptions of agriculture and life science during a general education life science course.* Presented at the North American Colleges and Teachers of Agriculture 53rd Annual Conference, Champagne, IL.

Rasmussen, C. (2008, March). *Worry Free! Stress Free! Technology in Biology.* Presentation accepted for the National Science Teachers Association National Convention, Boston, MA.

### Regional

Rasmussen, C., Warnick, B., & Miller, R. (2007, October). *Using a contextual learning model to teach science.* Presentation at the Northern Rocky Mountain Educational Research Association annual conference, Jackson Hole, WY.

Rasmussen, C., Monhardt, R. (2007, November). *Using Bird Sleuth: Most Wanted Birds in the Elementary Science Classroom.* Presentation at the National Science Teachers Association Regional Conference, Denver, CO.

## INVITED PRESENTATIONS

Rasmussen, C. (2007, October). *Surviving graduate school: A doctoral students' perspective*. Presented at Utah State University graduate course EDUC 7810, Logan, UT.

## SERVICE OPPORTUNITIES

- 2007 Conference Paper Proposal Reviewer - Northern Rocky Mountain Educational Research Association
- 2007-2008 Utah State University Secondary Education Graduate Student Senate Representative
- 2004 Provided in-service training on use of Electronic Gradebook at Willcox Middle School
- 2004, 2005 Organized and conducted Middle School Science Fair

## RESEARCH INTERESTS

- Teacher professional development
- Science Education
- Technology Integration into Education
- Agricultural Education
- Teacher Education
- Women in Science
- Contextual Teaching and Learning
- The use of animals in the classroom
- Models of learning and horse training